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by A. E. VAN VOGT
OCTOBER 1943
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SCIENCE-FICTION

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John W. Campbell, Jr., Editor, Catherine Tarrant, Assistant Editor

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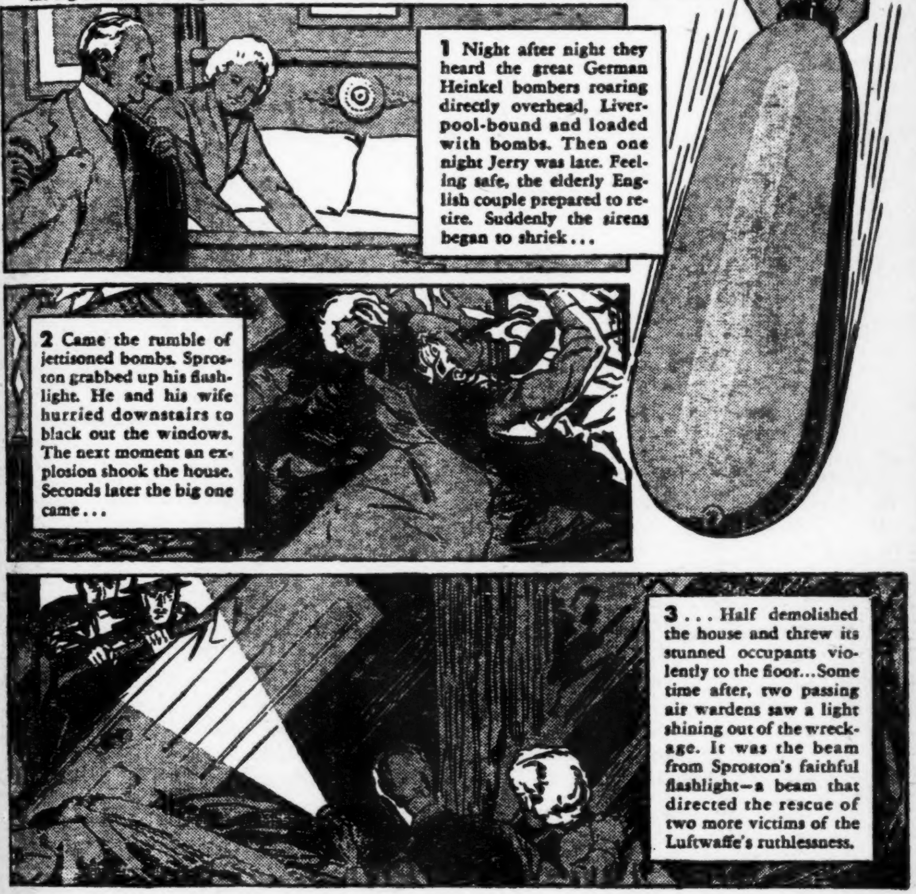
SECONDS LATER THE BIG ONE CAME!

A true experience of Mr. and Mrs. James Sproston, of Cheshire, during the big air blitz over England.



1 Night after night they heard the great German Heinkel bombers roaring directly overhead, Liverpool-bound and loaded with bombs. Then one night Jerry was late. Feeling safe, the elderly English couple prepared to retire. Suddenly the sirens began to shriek...

2 Came the rumble of jettisoned bombs. Sproston grabbed up his flashlight. He and his wife hurried downstairs to black out the windows. The next moment an explosion shook the house. Seconds later the big one came...

3 ... Half demolished the house and threw its stunned occupants violently to the floor... Some time after, two passing air wardens saw a light shining out of the wreckage. It was the beam from Sproston's faithful flashlight—a beam that directed the rescue of two more victims of the Luftwaffe's ruthlessness.

SPARE YOUR FLASHLIGHT BATTERIES!

For your own emergency protection (witness the Sproston's experience) as well as to conserve critical war materials, use your flashlight normally as little as possible. Make a habit of flashing it *intermittently*, not *continuously*. Also:

If you can't get "Eveready" flashlight batteries, don't blame your dealer. The Army, Navy and Lend-Lease get first call on the supply, and few are left for civilians.

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FRESH BATTERIES LAST LONGER...
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Concentration

Beginning with the November issue next month, Astounding goes into a yet smaller size—the smallest it has ever attained. The reason should be obvious by now—paper shortage. There's plenty of wood for wood pulp, plenty of machinery for production of the paper, and plenty of all the necessary chemicals—except chlorine, used for paper bleaching but needed more urgently for war-products processing; it's an extremely useful general reagent—but there is a decided shortage of two *sine qua non's*—manpower and transportation. So we use less paper.

But there will be surprisingly little reduction in content, because we will omit all advertising material; every page of the magazine will be a page of editorial material. The size will be somewhat larger than the "pocket" size books, but smaller than the present standard; there will be one hundred sixty pages of regular newsprint paper, plus sixteen pages of special material—a total of one hundred seventy-six pages. The sixteen special pages will be done in rotogravure, making it possible to print a number of articles which have absolutely required photographic articles and which, because of that, have been impossible heretofore.

The regular text will not be printed on the usual high-speed rotary press, either; we'll be using a slower, older, but definitely cleaner letterpress-type press. The letterpress type has never attained the speed of production required for the enormous runs needed for a chain of magazines as voluminous as the Street & Smith Publications, or for a modern major newspaper. But the high-speed rotary press has never succeeded in producing the clean, sharp, and really black type impression the older, slower method did. Since only two of the Street & Smith magazines will be using the small size, it will be practicable to run them on the slower letterpress.

The result of this change will, I sincerely believe, be pure improvement. In summary, it will mean the addition of rotogravure pages permitting good-quality photographs—incidentally, the change is sudden; our first new issue may not be able to take full advantage of that for lack of time in preparation—giving us a total of one hundred seventy-six pages. There will be no advertisements, so there'll be one hundred seventy-six pages of text. The printing method used will produce a cleaner, sharper type throughout the magazine. And, finally, the new-type binding machine will be available; the magazine will have a book-type binding that will open flat anywhere, instead of staples. It's a glue binding, and the tricks they can do with modern glues are rather startling. I've handled test dummies; the glue is a minutely thin layer along one edge of the thickness of each sheet of paper, an attachment that looks hopelessly fragile. But that glue is there to stay; it's a nonhardening type that stays flexible, and—you can try it yourself next month—the paper rips in tension before the glue lets go. If you save your copies, the new book-size magazine will stay in one piece; if you save tear sheets of favorite stories, you're going to have trouble getting tear sheets that aren't torn sheets. The pages stay put.

THE EDITOR.

I Will Train You at Home for Success in Radio

There is a SHORTAGE of RADIO Technicians and Radio Operators

I Trained These Men

$10 a Week in Spare Time

"I repaired some Radio sets when I was on my tenth lesson. I made $600 in a year and half, and I have made an average of $10 a week—just spare time." JOHN JERRY, 1337 Kalamath St., Denver, Colorado.

$200 a Month in Own Business

"For several years I have been in business for myself making around $200 a month. Business has steadily increased. I have N.R.I. to thank for my start in this field." ARLIE J. FROEHNER, 300 W. Texas Ave., Goose Creek, Texas.

Lieutenant in Signal Corps

"I cannot divulge any information as to my type of work, but I can say that N.R.I. training is certainly coming in mighty handy these days." (Name and address omitted for military reasons.)

Chief Operator Broadcasting Station

"Before I completed your lessons, I obtained my Radio Broadcast Operator's license and immediately joined Station WMPC where I am now Chief Operator." HOLLIS F. HAYES, 327 Madison St., Lapeer, Michigan.

Here's your chance to get a good job in a busy wartime field with a bright peacetime future! There is a real shortage today of trained Radio Technicians and Operators. So mail the Coupon for my FREE 64-page, illustrated book, "WIN RICH REWARDS IN RADIO." It describes many fascinating types of Radio jobs; tells how *you* can train for them at home in spare time!

More Men I Trained Now Make $50 a Week Than Ever Before

There's a big shortage of capable Radio Technicians and Operators because so many have joined the Army and Navy. Fixing Radios pays better now than for years. With new Radios out of production, fixing old sets, which were formerly traded in, adds greatly to the normal number of servicing jobs.

Broadcasting Stations, Aviation and Police Radio, Ship Radio and other communications branches are scrambling for Operators and Technicians to replace men who are leaving. You may never see a time again when it will be so easy to get started in this fascinating field. The Government, too, needs hundreds of competent civilian and enlisted Radio men and women. Radio factories now working on Government orders for Radio equipment employ trained men. And think of the NEW jobs Television, Frequency Modulation, Electronics and other Radio developments will open after the war! This is the sort of opportunity you shouldn't pass up.

J. E. SMITH, President, National Radio Institute Established 28 Years

Many Beginners Soon Make $5, $10 a Week EXTRA in Spare Time

There's probably an opportunity right in your neighborhood to make money in spare time fixing Radios. I'll give you the training that has started hundreds of N.R.I. students making $5, $10 a week extra within a few months after enrolling. The N.R.I. Course isn't something just prepared to take advantage of the present market for technical books and courses. It has been tried, tested, developed, perfected during the 28 years we have been teaching Radio.

Find Out What N. R. I. Can Do For You

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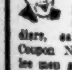

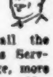

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AT ALL NEWSSTANDS

The Storm

by A. E. van Vogt

The combined military powers of all the people of that galaxy could not stand up to the tremendous might of the battleship of space. But there was one force their galaxy held that could smash that or any other ship!

Illustrated by Orban

Over the miles and the years, the gases drifted. Waste matter from ten thousand suns, a diffuse miasm of spent explosions, of dead hell fires and the furies of a hundred million raging sunspots—formless, purposeless.

But it was the beginning.

Into the great dark the gases crept. Calcium was in them, and sodium, and hydrogen; and the speed of the drift varied up to twenty miles a second.

There was a timeless period while gravitation performed its function. The inchoate mass became masses. Great blobs of gas took a semblance of shape in widely separate areas, and moved on and on and on.

They came finally to where a thousand flaring seetee suns had long before doggedly "crossed the street" of the main stream of terrene suns. Had crossed, and left *their* excrement of gases.

The first clash quickened the vast worlds of gas. The electron haze of terrene plunged like spurred horses and sped deeper into the equally violently reacting positron haze of contraterrene. Instantly, the lighter orbital positrons and electrons went up in a blaze of hard radiation.

The storm was on.

The stripped seetee nuclei carried now terrific and unbalanced negative charges and repelled electrons, but tended to attract terrene atom nuclei. In their turn the stripped terrene nuclei attracted contraterrene.

Violent beyond all conception were the resulting cancellations of charges.

The two opposing masses heaved and spun in a cataclysm of partial adjustment. They had been heading in different directions. More and more they became one tangled, seething whirlpool.

The new course, uncertain at first, steadied and became a line drive through the midnight heavens. On a front of nine light years, at a solid fraction of the velocity of light, the storm roared toward its destiny.

Suns were engulfed for half a hundred years—and left behind with only a hammering of cosmic rays to show that they had been the centers of otherwise invisible, impalpable atomic devastation.

In its four hundred and ninetieth Sidereal year, the storm intersected the orbit of a Nova at the flash moment.

It began to move!

On the three-dimensional map at weather headquarters on the planet Kaider III, the storm was colored orange. Which meant it was the biggest of the four hundred odd storms raging in the Fifty Suns region of the Lesser Magellanic Cloud.

It showed as an uneven splotch fronting at Latitude 473, Longitude 228, Center 190 parsecs, but that was a special Fifty Suns degree system which had no relation to the magnetic center of the Magellanic Cloud as a whole.

The report about the Nova had not yet been registered on the map. When that happened the storm color would be changed to an angry red.

They had stopped looking at the map. Maltby stood with the councilors at the great window staring up at the Earth ship.

The machine was scarcely more than a dark sliver in the distant sky. But the sight of it seemed to hold a deadly fascination for the older men.

Maltby felt cool, determined, but also sardonic. It was funny, these—these people of the Fifty Suns in this hour of their danger calling upon *him*.

He unfocused his eyes from the ship, fixed his steely, laconic gaze on the plump, perspiring chairman of the Kaider III government—and, tensing his mind, forced the man to look at him. The councilor, unaware of the compulsion, conscious only that he had turned, said:

"You understand your instructions, Captain Maltby?"

Maltby nodded. "I do."

The curt words must have evoked a vivid picture. The fat face rippled like palsied jelly and broke out in a new trickle of sweat.

"The worst part of it all," the man groaned, "is that the people of the ship found us by the wildest accident. They had run into one of our meteorite stations and captured its attendant. The attendant sent a general warning and then forced them to kill him before they could discover which of the fifty million suns of the Lesser Magellanic Cloud was us.

"Unfortunately, they did discover that he and the rest of us were all descendants of the robots who had escaped the massacre of the robots in the main galaxy fifteen thousand years ago.

"But they were baffled, and without a clue. They started home, stopping off at planets on the way on a chance basis. The seventh stop was us. Captain Maltby—"

The man looked almost beside himself. He shook. His face was as colorless as a white shroud. He went on hoarsely:

"Captain Maltby, you must not fail. They have asked for a meteorologist to guide them to Cassidor VII, where the central government is located. They mustn't reach there. You must drive them into the great storm at 473.

"We have commissioned you to do this for us because you have the two minds of the Mixed Men. We regret that we have not always fully appreciated your services in the past. But you must admit that, after the wars of the Mixed Men, it was natural that we should be careful about—"

Maltby cut off the lame apology. "Forget it," he said. "The Mixed Men are robots, too, and therefore as deeply involved, as I see it, as the Dellians and non-Dellians. Just what the Hidden Ones of my kind think, I don't know, nor do I care. I assure you I shall do my best to destroy this ship."

"Be careful!" the chairman urged anxiously. "This ship could destroy us, our planet, our sun in a single minute. We never dreamed that Earth could have gotten so far ahead of us and produced such a devastatingly powerful machine. After all, the non-Dellian robots and, of course, the Mixed Men among us are capable of research work; the former have been laboring feverishly for thousands of years.

"But, finally, remember that you are not being asked to commit suicide. The battleship is absolutely invincible. Just how it will survive a real storm we were not told when we were shown around. But it will. What happens, however, is that everyone aboard becomes unconscious.

"As a Mixed Man you will be the first to revive. Our combined fleets will be waiting to board the ship the moment you open the doors. Is that clear?"

It had been clear the first time it was explained, but these non-Dellians had a habit of repeating themselves, as if thoughts kept growing vague in their minds. As Maltby closed the door of the great room behind him, one of the councilors said to his neighbor:

"Has he been told that the storm has gone Nova?"

The fat man overheard. He shook his head. His eyes gleamed as he said quietly: "No. After all, he is one of the Mixed Men. We can't trust him too far no matter what his record."

All morning the reports had come in. Some showed progress, some didn't. But her basic good humor was untouched by the failures.

The great reality was that her luck had held. She had found a planet of the robots. Only one planet so far, but—

Grand Captain Laurr smiled grimly. It wouldn't be long now. Being a supreme commander was a terrible business. But she had not shrunk from making the deadly threat: provide all required information, or the entire planet of Kaider III would be destroyed.

The information was coming in: Population of Kaider III two billion, one hundred million, two-fifths Dellian, three-fifths non-Dellian robots.

Dellians physically and mentally the higher type, but completely lacking in creative ability. Non-Dellians dominated in the research laboratories.

The forty-nine other suns whose planets were inhabited were called, in alphabetical order: Assora, Atmion, Bresp, Buraco, Cassidor, Corrab— They were located at (1) Assora: Latitude 931, Longitude 27, Center 201 parsecs; (2) Atmion—

It went on and on. Just before noon she noted with steely amusement that there was still nothing coming through from the meteorology room, nothing at all about storms.

She made the proper connection and flung her words: "What's the matter, Lieutenant Cannons? Your assistants have been making prints and duplicates of various Kaider maps. Aren't you getting anything?"

The old meteorologist shook his head. "You will recall, noble lady, that when we captured that robot in space, he had time to send out a warning. Immediately on every Fifty Suns planet, all maps were despoiled, civilian meteorologists were placed aboard spaceships, that were stripped of receiving radios, with orders to go to a planet on a chance basis, and stay there for ten years.

"To my mind, all this was done before it was clearly grasped that their navy hadn't a chance against us. Now they are going to provide us with a naval meteorologist, but we shall have to depend on our lie detectors as to whether or not he is telling us the truth."

"I see." The woman smiled. "Have no fear. They don't dare oppose us openly. No doubt there is a plan being built up against us, but it cannot prevail now that we can take action to enforce our unalterable will. Whoever they send must tell us the truth. Let me know when he comes."

Lunch came, but she ate at her desk, watching the flashing pictures on the astro, listening to the murmur of voices, storing the facts, the general picture, into her brain.

"There's no doubt, Captain Turgess," she commented once, savagely, "that we're being lied to on a vast scale. But let it be so. We can use psychological tests to verify all the vital details.

"For the time being it is important that you relieve the fears of everyone you find it necessary to question. We must convince these people that Earth will accept them on an equal basis without bias or prejudice of any kind because of their robot orig—"

She bit her lip. "That's an ugly word,

the worst kind of propaganda. We must eliminate it from our thoughts."

"I'm afraid," the officer shrugged, "not from our thoughts."

She stared at him, narrow-eyed, then cut him off angrily. A moment later she was talking into the general transmitter: "The word robot must not be used—by any of our personnel—under pain of fine—"

Switching off, she put a busy signal on her spare receiver, and called Psychology House. Lieutenant Neslor's face appeared on the plate.

"I heard your order just now, noble lady," the woman psychologist said. "I'm afraid, however, that we're dealing with the deepest instincts of the human animal—hatred or fear of the stranger, the alien.

"Excellency, we come from a long line of ancestors who, in their time, have felt superior to others because of some slight variation in the pigmentation of the skin. It is even recorded that the color of the eyes has influenced the egoistic in historical decisions. We have sailed into very deep waters, and it will be the crowning achievement of our life if we sail out in a satisfactory fashion."

There was an eager lilt in the psychologist's voice; and the grand captain experienced a responsive thrill of joy. If there was one thing she appreciated, it was the positive outlook, the kind of people who faced all obstacles short of the recognizably impossible with a youthful zest, a will to win. She was still smiling as she broke the connection.

The high thrill sagged. She sat cold with her problem. It was a problem. Hers. All aristocratic officers had *carte blanche* powers, and were expected to solve difficulties involving anything up to whole groups of planetary systems.

After a minute she dialed the meteorology room again.

"Lieutenant Cannons, when the meteorology officer of the Fifty Suns navy arrives, please employ the following tactics—"

Maltby waved dismissal to the driver of his car. The machine pulled away from the curb and Maltby stood frowning at the flaming energy barrier that barred farther progress along the street. Finally, he took another look at the Earth ship.

It was directly above him now that he had come so many miles across the city toward it. It was tremendously high up, a long, black torpedo shape almost lost in the mist of distance.

But high as it was it was still visibly bigger than anything ever seen by the Fifty Suns, an incredible creature of metal from a world so far away that, almost, it had sunk to the status of myth.

Here was the reality. There would be tests, he thought, penetrating tests before they'd accept any orbit he planned. It wasn't that he doubted the ability of his double mind to overcome anything like that, but—

Well to remember that the frightful gap of years which separated the science of Earth from that of the Fifty Suns had already shown unpleasant surprises. Maltby shook himself grimly and gave his full attention to the street ahead.

A fan-shaped pink fire spread skyward from two machines that stood in the center of the street. The flame was a very pale pink and completely transparent. It looked electronic, deadly.

Beyond it were men in glittering uniforms. A steady trickle of them moved in and out of buildings. About three blocks down the avenue a second curtain of pink fire flared up.

There seemed to be no attempt to guard the sides. The men he could see looked at ease, confident. There was murmured conversation, low laughter and—they weren't all men.

As Maltby walked forward, two fine-looking young women in uniform came down the steps of the nearest of the requisitioned buildings. One of the guards of the flame said something to them. There was a twin tinkle of silvery laughter. Still laughing, they strode off down the street.

It was suddenly exciting. There was an air about these people of far places, of tremendous and wonderful lands beyond the farthest horizons of the staid Fifty Suns.

He felt cold, then hot, then he glanced up at the fantastically big ship; and the chill came back. One ship, he thought, but so big, so mighty that thirty billion people didn't dare send their own fleets against it. They—

He grew aware that one of the brilliantly arrayed guards was staring at him. The man spoke into a wrist radio, and after a moment a second man broke off his conversation with a third soldier and came over. He stared through the flame barrier at Maltby.

"Is there anything you desire? Or are you just looking?"

He spoke English, curiously accented—but English! His manner was mild, almost gentle, cultured. The whole effect had a naturalness, an unalienness that was pleasing. After all, Maltby thought, he had never had the fear of these people that the others had. His very plan to defeat the ship was based upon his own fundamental belief that the robots were indestructible in the sense that no one could ever wipe them out completely.

Quietly, Maltby explained his presence.

"Oh, yes," the man nodded, "we've been expecting you. I'm to take you at once to the meteorological room of the ship. Just a moment—"

The flame barrier went down and Maltby was led into one of the buildings. There was a long corridor, and the transmitter that projected him into the ship must have been focused somewhere along it.

Because abruptly he was in a very large room. Maps floated in half a dozen antigravity pits. The walls shed light from millions of tiny point sources. And everywhere were tables with curved lines of very dim but sharply etched light on their surfaces.

Maltby's guide was nowhere to be seen. Coming toward him, however, was a tall, fine-looking old man. The oldster offered his hand.

"My name is Lieutenant Cannons, senior ship meteorologist. If you will sit down here we can plan an orbit and the ship can start moving within the hour. The grand captain is very anxious that we get started."

Maltby nodded casually. But he was stiff, alert. He stood quite still, feeling around with that acute second mind of his, his Dellian mind, for energy pressures that would show secret attempts to watch or control his mind.

But there was nothing like that.

He smiled finally, grimly. It was going to be as simple as this, was it? Like hell it was.

As he sat down, Maltby felt suddenly cozy and alive. The pure exhilaration of existence burned through him like a flame. He recognized the singing excitement for the battle thrill it was and felt a grim joy that for the first time in fifteen years he could do something about it.

During his long service in the Fifty Suns navy, he had faced hostility and suspicion because he was a Mixed Man. And always he had felt helpless, unable to do anything about it. Now, here was a far more basic hostility, however veiled, and a suspicion that must be like a burning fire.

And this time he could fight. He could look this skillfully voluble, friendly old man squarely in the eye and—

Friendly?

"It makes me smile sometimes," the old man was saying, "when I think of the unscientific aspects of the orbit we have to plan now. For instance, what is the time lag on storm reports out here?"

Maltby could not suppress a smile. So Lieutenant Cannons wanted to know things, did he? To give the man credit, it wasn't really a lame opening. The truth was, the only way to ask a question was—well—to ask it. Maltby said:

"Oh, three, four months. Nothing unusual. Each space meteorologist takes about that length of time to check the bounds of the particular storm in his area, and then he reports, and we adjust our maps.

"Fortunately"—he pushed his second mind to the fore as he coolly spoke the great basic lie—"there are no major storms between the Kaidor and Cassidor suns."

He went on, sliding over the untruth like an eel breasting wet rock:

"However, several suns prevent a straight line movement. So if you would show me some of your orbits for twenty-five hundred light years, I'll make a selection of the best ones."

He wasn't, he realized instantly, going to slip over his main point as easily as that.

"No intervening storms?" the old man said. He pursed his lips. The fine lines in his long face seemed to deepen. He looked genuinely nonplused; and there was no doubt at all that he hadn't expected such a straightforward statement. "Hm-m-m, no storms. That does make it simple, doesn't it?"

He broke off. "You know, the important thing about two"—he hesitated over the word, then went on—"two people, who have been brought up in different cultures, under different scientific standards, is that they make sure they are discussing a subject from a common viewpoint.

"Space is so big. Even this comparatively small system of stars, the Lesser Magellanic Cloud, is so vast that it defies our reason. We on the battleship *Star Cluster* have spent ten years surveying it, and now we are able to say glibly that it comprises two hundred sixty billion cubic light years, and contains fifty millions of suns.

"We located the magnetic center of the Cloud, fixed our zero line from center to the great brightest star, S Doradus; and now, I suppose, there are people who would be fools enough to think we've got the system stowed away in our brainpans."

Maltby was silent because he himself was just such a fool. This was warning. He was being told in no uncertain terms that they were in a position to check any orbit he gave them with respect to all intervening suns.

It meant much more. It showed that Earth was on the verge of extending her tremendous sway to the Lesser Magellanic Cloud. Destroying this ship now would provide the Fifty Suns with precious years during which they would have to decide what they intended to do.

But that would be all. Other ships would come; the inexorable pressure of the stupendous populations of the main galaxy would burst out even farther into space. Always under careful control, shepherded by mighty hosts of invincible battleships, the great transports would sweep into the Cloud, and every planet everywhere, robot or non-robot, would acknowledge Earth suzerainty.

Imperial Earth recognized no separate nations of any description anywhere. The robots, Dellian, non-Dellian and Mixed, would need every extra day, every hour; and it was lucky for them all that he was not basing his hope of destroying this ship on an orbit that would end inside a sun.

Their survey had magnetically placed all the suns for them. But they couldn't know about the storms. Not in ten years or in a hundred was it possible for one ship to locate possible storms in an area that involved twenty-five hundred light years of length.

Unless their psychologists could uncover the special qualities of his double brain, he had them. He grew aware that Lieutenant Cannons was manipulating the controls of the orbit table.

The lines of light on the surface flickered and shifted. Then settled like the balls in a game of chance. Maltby selected six that ran deep into the great storm. Ten minutes after that he felt the faint jar as the ship began to move. He stood up, frowning. Odd that they should act without *some* verification of his—

"This way," said the old man.

Maltby thought sharply: This couldn't be all. Any minute now they'd start on him and—

His thought ended.

He was in space. Far, far below was the receding planet of Kaider III. To one side gleamed the vast dark hull of the battleship; and on every other side, and up, and down, were stars and the distances of dark space.

In spite of all his will, the shock was inexpressibly violent.

His active mind jerked. He staggered physically; and he would have fallen like a blindfolded creature except that, in the movement of trying to keep on his feet, he recognized that he *was* still on his feet.

His whole being steadied. Instinctively, he—tilted—his second mind awake, and pushed it forward. Put its more mechanical and precise qualities, its Dellian strength, between his other self and whatever the human beings might be doing against him.

Somewhere in the mist of darkness and blazing stars, a woman's clear and resonant voice said:

"Well, Lieutenant Neslor, did the surprise yield any psychological fruits?"

The reply came from a second, an older-sounding woman's voice:

"After three seconds, noble lady, his resistance leaped to I. Q. 900. Which means they've sent us a Dellian. Your excellency, I thought you specifically asked that their representative be not a Dellian."

Maltby said swiftly into the night around him: "You're quite mistaken. I am not a Dellian. And I assure you that I will lower my resistance to zero if you desire. I reacted instinctively to surprise, naturally enough."

There was a click. The illusion of space and stars snapped out of existence. Maltby saw what he had begun to suspect, that he was, had been all the time, in the meteorology room.

Nearby stood the old man, a thin smile on his lined face. On a raised dais, partly hidden behind a long instrument board, sat a handsome young woman. It was the old man who spoke. He said in a stately voice:

"You are in the presence of Grand Captain, the Right Honorable Gloria Cecily, the Lady Laurr of Noble Laurr. Conduct yourself accordingly."

Maltby bowed but he said nothing. The grand captain frowned at him, impressed by his appearance. Tall, magnificent-looking body—strong, supremely intelligent face. In a single flash she noted all the characteristics common to the first-class human being and robot.

These people might be more dangerous than she had thought. She said with unnatural sharpness for her:

"As you know, we have to question you. We would prefer that you do not take offense. You have told us that Cassidor VII, the chief planet of the Fifty Suns, is twenty-five hundred light years from here. Normally, we would spend more than sixty years *feeling* our way across such an immense gap of uncharted, star-filled space. But you have given us a choice of orbits.

"We must make sure those orbits are honest, offered without guile or harmful purpose. To that end we have to ask you to open your mind and answer our questions under the strictest psychological surveillance."

"I have orders," said Maltby, "to cooperate with you in every way."

He had wondered how he would feel, now that the hour of decision was upon him. But there was nothing unnormal. His body was a little stiffer, but his minds—

He withdrew his *self* into the background and left his Dellian mind to confront all the questions that came. His Dellian mind that he had deliberately kept apart from his thoughts. That curious mind, which had no will of its own, but which, by remote control, reacted with the full power of an I. Q. of 191.

Sometimes, he marveled himself at that second mind of his. It had no creative ability, but its memory was machinelike, and its resistance to outside pressure was, as the woman psychologist had so swiftly analyzed, over nine hundred. To be exact, the equivalent of I. Q. 917.

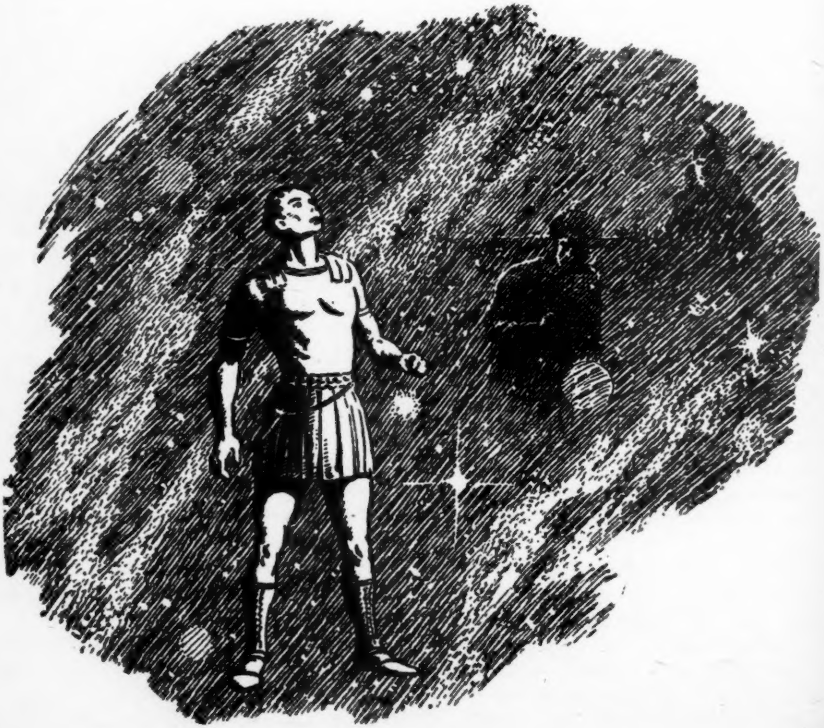
"What is your name?"

That was the way it began: His name, distinction— He answered everything quietly, positively, without hesitation. When he had finished, when he had sworn to the truth of every word about the storms, there was a long moment of dead silence. And then a middle-aged woman stepped out of the nearby wall.

She came over and motioned him into a chair. When he was seated she tilted his head and began to examine it. She did it gently; her fingers were caressing as a lover's. But when she looked up she said sharply:

"You're not a Dellian or a non-Dellian. And the molecular structure of your brain and body is the most curious I've ever seen. All the molecules are twins. I saw a similar arrangement once in an artificial electronic structure where an attempt was being made to balance an unstable electronic structure. The parallel isn't exact, but —mm-m-m, I must try to remember what the end result was of that experiment."

She broke off: "What is your explanation? What are you?"



Maltby sighed. He had determined to tell only the one main lie. Not that it mattered so far as his double brain was concerned. But untruths effected slight variations in blood pressure, created neural spasms and disturbed muscular integration. He couldn't take the risk of even one more than was absolutely necessary.

"I'm a Mixed Man," he explained. He described briefly how the cross between the Dellian and non-Dellian, so long impossible, had finally been brought about a hundred years before. The use of cold and pressure—

"Just a moment," said the psychologist.

She disappeared. When she stepped again out of the wall transmitter, she was thoughtful.

"He seems to be telling the truth," she confessed, almost reluctantly.

"What is this?" snapped the grand captain. "Ever since we ran into that first citizen of the Fifty Suns, the psychology department has qualified every statement it issues. I thought psychology was the only perfect science. Either he is telling the truth or he isn't."

The older woman looked unhappy. She stared very hard at Maltby, seemed baffled by his cool gaze, and finally faced her superior, said:

"It's that double molecule structure of his brain. Except for that, I see no reason why you shouldn't order full acceleration."

The grand captain smiled. "I shall have Captain Maltby to dinner tonight. I'm sure he will co-operate then with any further studies you may be prepared to make at that time. Meanwhile I think—"

She spoke into a communicator: "Central engines, step up to half light year a minute on the following orbit—"

Maltby listened, estimating with his Dellian mind. Half a light year a minute; it would take a while to attain that speed, but—in eight hours they'd strike the storm. In eight hours he'd be having dinner with the grand captain.

Eight hours!

The full flood of a contraterrene Nova impinging upon terrene gases already infuriated by seetee gone insane—that was the new, greater storm.

The exploding, giant sun added weight to the diffuse, maddened thing. And it added something far more deadly.

Speed! From peak to peak of velocity the tumult of ultrafire leaped. The swifter crags of the storm danced and burned with an absolutely hellish fury.

The sequence of action was rapid almost beyond the bearance of matter. First raced the light of the Nova, blazing its warning at more than a hundred and eighty-six thousand miles a second to all who knew that it flashed from the edge of an interstellar storm.

But the advance glare of warning was nullified by the colossal speed of the storm. For weeks and months it drove through the vast night at a velocity that was only a bare measure short of that of light itself.

The dinner dishes had been cleared away. Maltby was thinking: In half an hour—*half an hour!*

He was wondering shakily just what did happen to a battleship suddenly confronted by thousands of gravities of deceleration. Aloud he was saying:

"My day? I spent it in the library. Mainly, I was interested in the recent history of Earth's interstellar colonization. I'm curious as to what is done with groups like the Mixed Men. I mentioned to you that, after the war in which they were defeated largely because there was so few of them, the Mixed Men hid themselves from the Fifty Suns. I was one of the captured children who—"

There was an interruption, a cry from the wall communicator: *"Noble lady, I've solved it!"*

A moment fled before Maltby recognized the strained voice of the woman psychologist. He had almost forgotten that she was supposed to be studying him. Her next words chilled him:

"Two minds! I thought of it a little while ago and rigged up a twin watching device. Ask him, *ask* him the question about the storms. Meanwhile stop the ship. At once!"

Maltby's dark gaze clashed hard with the steely, narrowed eyes of the grand captain. Without hesitation he concentrated his two minds on her, forced her to say:

"Don't be silly, lieutenant. One person can't have two brains. Explain yourself further."

His hope was delay. They had ten minutes in which they could save themselves. He must waste every second of that time, resist all their efforts, try to control the situation. If only his special three-dimensional hypnotism worked through communicators—

It didn't. Lines of light leaped at him from the wall and crisscrossed his body, held him in his chair like so many unbreakable cables. Even as he was bound hand and foot by palpable energy, a second complex of forces built up before his face, barred his thought pressure from the grand captain, and finally coned over his head like a dunce cap.

He was caught as neatly as if a dozen men had swarmed with their strength and weight over his body. Maltby relaxed and laughed.

"Too late," he taunted. "It'll take at least an hour for this ship to reduce to a safe speed; and at this velocity you can't turn aside in time to avoid the greatest storm in this part of the Universe."

That wasn't strictly true. There was still time and room to sheer off before the advancing storm in any of the fronting directions. The impossibility was to turn toward the storm's tail or its great, bulging sides.

His thought was interrupted by the first cry from the young woman; a piercing cry: "Central engines! Reduce speed! Emergency!"

There was a jar that shook the walls and a pressure that tore at his muscles. Maltby adjusted and then stared across the table at the grand captain. She was smiling, a frozen mask of a smile; and she said from between clenched teeth:

"Lieutenant Neslor, use any means physical or otherwise, but make him talk. There must be something."

"His second mind is the key," the psychologist's voice came. It's not Dellian. It has only normal resistance. I shall subject it to the greatest concentration of conditioning ever focused on a human brain, using the two basics: sex and logic. I shall have to use you, noble lady, as the object of his affections."

"Hurry!" said the young woman. Her voice was like a metal bar.

Maltby sat in a mist, mental and physical. Deep in his mind was awareness that he was an entity, and that irresistible machines were striving to mold his thought.

He resisted. The resistance was as strong as his life, as intense as all the billions and quadrillions of impulses that had shaped his being, could make it.

But the outside thought, the pressure, grew stronger. How silly of him to resist Earth—when this lovely woman of Earth loved him, loved him, loved him. Glorious was that civilization of Earth and the main galaxy. Three hundred million billion people. The very first contact would rejuvenate the Fifty Suns. How lovely she is; I must save her. She means everything to me.

As from a great distance, he began to hear his own voice, explaining what must be done, just how the ship must be turned, in what direction, how much time there was. He tried to stop himself, but inexorably his voice went on, mouthing the words that spelled defeat for the Fifty Suns.

The mist began to fade. The terrible

pressure eased from his straining mind. The damning stream of words ceased to pour from his lips. He sat up shakily, conscious that the energy cords and the energy cap had been withdrawn from his body. He heard the grand captain say into a communicator:

"By making a point 0100 turn we shall miss the storm by seven light weeks. I admit it is an appallingly sharp curve, but I feel that we should have at least that much leeway."

She turned and stared at Maltby: "Prepare yourself. At half a light year a minute even a hundredth of a degree turn makes some people black out."

"Not me," said Maltby, and tensed his Dellian muscles.

She fainted three times during the next four minutes as he sat there watching her. But each time she came to within seconds.

"We human beings," she said wanly, finally, "are a poor lot. But at least we know how to endure."

The terrible minutes dragged. And dragged. Maltby began to feel the strain of that infinitesimal turn. He thought at last: Space! How could these people ever hope to survive a direct hit on a storm?

Abruptly, it was over; a man's voice said quietly: "We have followed the prescribed course, noble lady, and are now out of dang—"

He broke off with a shout: "Captain, the light of a Nova sun has just flashed from the direction of the storm. We—"

In those minutes before disaster struck, the battleship *Star Cluster* glowed like an immense and brilliant jewel. The warning glare from the Nova set off an incredible roar of emergency clamor through all of her hundred and twenty decks.

From end to end her lights flicked on. They burned row by row straight across her four thousand feet of length with the hard tinkle of cut gems. In the reflection of that light, the black mountain that was her hull looked like the fabulous planet of Cassidor, her destination, as seen at night from a far darkness, sown with diamond shining cities.

Silent as a ghost, grand and wonderful beyond all imagination, glorious in her power, the great ship slid through the blackness along the special river of time and space which was her plotted course.

Even as she rode into the storm there was nothing visible. The space ahead looked as clear as any vacuum. So tenuous were the gases that made up the storm that the ship would not even have been aware of them if it had been traveling at atomic speeds.

Violent the disintegration of matter in that storm might be, and the sole source of cosmic rays the hardest energy in the known universe. But the immense, the cataclysmic danger to the *Star Cluster* was a direct result of her own terrible velocity.

If she had had time to slow, the storm would have meant nothing.

Striking that mass of gas at half a light year a minute was like running into an unending solid wall. The great ship shuddered in every plate as the deceleration tore at her gigantic strength.

In seconds she had run the gamut of all the recoil systems her designers had planned for her as a unit.

She began to break up.

And still everything was according to the original purpose of the superb engineering firm that had built her. The limit of unit strain reached, she dissolved into her nine thousand separate sections.

Streamlined needles of metal were those sections, four hundred feet long, forty feet wide; sliverlike shapes that sinuated cunningly through the gases, letting the pressure of them slide off their smooth hides.

But it wasn't enough. Metal groaned from the torture of deceleration. In the deceleration chambers, men and women lay at the bare edge of consciousness, enduring agony that seemed on the verge of being beyond endurance.

Hundreds of the sections careened into each other in spite of automatic screens, and instantaneously fused into white-hot coffins.

And still, in spite of the hideously maintained velocity, that mass of gases was not bridged; light years of thickness had still to be covered.

For those sections that remained, once more all the limits of human strength were reached. The final action was chemical, directly on the human bodies that remained of the original thirty thousand. Those bodies for whose sole benefit all the marvelous safety devices had been conceived and constructed, the poor, fragile, human beings who through all the ages had persisted in dying under normal conditions from a pressure of something less than fifteen gravities.

The prompt reaction of the automatics in rolling back every floor, and plunging every person into the deceleration chambers of each section—that saving reaction was abruptly augmented as the deceleration chamber was flooded by a special type of gas.

Wet was that gas, and clinging. It settled thickly on the clothes of the humans, soaked through to the skin and *through* the skin, into every part of the body.

Sleep came gently, and with it a wonderful relaxation. The blood grew immune to shock; muscles that, in a minute before, had been drawn with anguish—loosened; the brain impregnated with life-giving chemicals that relieved it of all shortages remained untroubled even by dreams.

Everybody grew enormously flexible to gravitation pressures—a hundred—a hundred and fifty gravities of deceleration; and still the life force clung.

The great heart of the Universe beat on. The storm roared along its inescapable artery, creating the radiance of life, purging the dark of its poisons—and at last the tiny ships in their separate courses burst its great bounds.

They began to come together, to seek each other, as if among them there was an irresistible passion that demanded intimacy of union.

Automatically, they slid into their old positions; the battleship *Star Cluster* began again to take form—but there were gaps. Segments destroyed, and segments lost.

On the third day Acting Grand Captain Rutgers called the surviving captains to the forward bridge, where he was temporarily making his headquarters. After the conference a communique was issued to the crew:

> At 008 hours this morning a message was received from Grand Captain, the Right Honorable Gloria Cecily, the Lady Laurr of Noble Laurr, I. C., C. M., G. K. R. She has been forced down on the planet of a yellow-white sun. Her ship crashed on landing, and is unrepairable. As all communication with her has been by nondirectional sub-space radio, and as it will be utterly impossible to locate such an ordinary type sun among so many millions of other suns, the Captains in Session regret to report that our noble lady's name must now be added to that longest of all lists of naval casualties: the list of those who have been lost forever on active duty.
>
> The admiralty lights will burn blue until further notice.

Her back was to him as he approached. Maltby hesitated, then tensed his mind, and held her there beside the section of ship that had been the main bridge of the *Star Cluster*.

The long metal shape lay half buried in the marshy ground of the great valley, its lower end jutting down into the shimmering deep yellowish black waters of a sluggish river.

Maltby paused a few feet from the tall, slim woman, and, still holding her unaware of him, examined once again the environment that was to be their life.

The fine spray of dark rain that had dogged his exploration walk was retreating over the yellow rim of valley to the "west."

As he watched, a small yellow sun burst out from behind a curtain of dark, ocherous clouds and glared at him brilliantly. Below it an expanse of jungle glinted strangely brown and yellow.

Everywhere was that dark-brown and intense, almost liquid yellow.

Maltby sighed—and turned his attention to the woman, willed her not to see him as he walked around in front of her.

He had given a great deal of thought to the Right Honorable Gloria Cecily during his walk. Basically, of course, the problem of a man and a woman who were destined to live the rest of their lives together, alone, on a remote planet, was very simple. Particularly in view of the fact that one of the two had been conditioned to be in love with the other.

Maltby smiled grimly. He could appreciate the artificial origin of that love. But that didn't dispose of the profound fact of it.

The conditioning machine had struck to his very core. Unfortunately, it had not touched her at all; and two days of being alone with her had brought out one reality:

The Lady Laurr of Noble Laurr was not even remotely thinking of yielding herself to the normal requirements of the situation.

It was time that she was made aware, not because an early solution was necessary or even desirable, but because she had to realize that the problem existed.

He stepped forward and took her in his arms.

She was a tall, graceful woman; she fitted into his embrace as if she belonged there; and, because his control of her made her return the kiss, its warmth had an effect beyond his intention.

He had intended to free her mind in the middle of the kiss.

He didn't.

When he finally released her, it was only a physical release. Her mind was still completely under his domination.

There was a metal chair that had been set just outside one of the doors. Maltby walked over, sank into it and stared up at the grand captain.

He felt shaken. The flame of desire that had leaped through him was a telling tribute to the conditioning he had undergone. But it was entirely beyond his previous analysis of the intensity of his own feelings.

He had thought he was in full control of himself, and he wasn't. Somehow, the sardonicism, the half detachment, the objectivity, which he had fancied was the keynote of his own reaction to this situation, didn't apply at all.

The conditioning machine had been thorough.

He loved this woman with such a violence that the mere touch of her was enough to disconnect his will from operations immediately following.

His heart grew quieter; he studied her with a semblance of detachment.

She was lovely in a handsome fashion; though almost all robot women of the Dellian race were better-looking. Her lips, while medium full, were somehow a trifle cruel; and there was a quality in her eyes that accentuated that cruelty.

There were built-up emotions in this woman that would not surrender easily to the idea of being marooned for life on an unknown planet.

It was something he would have to think over. Until then—

Maltby sighed. And released her from the three-dimensional hypnotic spell that his two minds had imposed on her.

He had taken the precaution of turning her away from him. He watched her curiously as she stood, back to him, for a moment, very still. Then she walked over to a little knob of trees above the springy, soggy marsh land.

She climbed up it and gazed in the direction from which he had come a few minutes before. Evidently looking for him.

She turned finally, shaded her face

against the yellow brightness of the sinking sun, came down from the hillock and saw him.

She stopped; her eyes narrowed. She walked over slowly. She said with an odd edge in her voice:

"You came very quietly. You must have circled and walked in from the west."

"No," said Maltby deliberately, "I stayed in the east."

She seemed to consider that. She was silent, her lean face creased into a frown. She pressed her lips together, finally; there was a bruise there that must have hurt, for she winced, then she said:

"What did you discover? Did you find any—"

She stopped. Consciousness of the bruise on her lip must have penetrated at that moment. Her hand jerked up, her fingers touched the tender spot. Her eyes came alive with the violence of her comprehension. Before she could speak, Maltby said:

"Yes, you're quite right."

She stood looking at him. Her stormy gaze quietened. She said finally, in a stony voice:

"If you try that again I shall feel justified in shooting you."

Maltby shook his head. He said, unsmiling:

"And spend the rest of your life here alone? You'd go mad."

He saw instantly that her basic anger was too great for that kind of logic. He went on swiftly:

"Besides, you'd have to shoot me in the back. I have no doubt you could do that in the line of duty. But not for personal reasons."

Her compressed lips—separated. To his amazement there were suddenly tears in her eyes. Anger tears, obviously. But tears!

She stepped forward with a quick movement and slapped his face.

"You robot!" she sobbed.

Maltby stared at her ruefully; then he laughed. Finally he said, a trace of mockery in his tone:

"If I remember rightly, the lady who just spoke is the same one who delivered a ringing radio address to all the planets of the Fifty Suns swearing that in fifteen thousand years Earth people had forgotten all their prejudices against robots.

"Is it possible," he finished, "that the problem on *closer* investigation is proving more difficult?"

There was no answer. The Honorable Gloria Cecily brushed past him and disappeared into the interior of the ship.

She came out again a few minutes later.

Her expression was more serene; Maltby noted that she had removed all trace of the tears. She looked at him steadily, said:

"What did you discover when you were out? I've been delaying my call to the ship till you returned."

Maltby said: "I thought they asked you to call at 010 hours."

The woman shrugged; and there was an arrogant note in her voice as she replied:

"They'll take my calls when I make them. Did you find any sign of intelligent life?"

Maltby allowed himself brief pity for a human being who had as many shocks still to absorb as had Grand Captain Laurr.

One of the books he had read while aboard the battleship about colonists of remote planets had dealt very specifically with castaways.

He shook himself and began his description. "Mostly marsh land in the valley and there's jungle, very old. Even some of the trees are immense, though sections show no growth rings—some interesting beasts and a four-legged, two-armed thing that watched me from a distance. It carried a spear but it was too far away for me to use my hypnotism on it. There must be a village somewhere, perhaps on the valley rim. My idea is that during the next months I'll cut the ship into small sections and transport it to drier ground.

"I would say that we have the following information to offer the ship's scientists: We're on a planet of a G-type sun. The sun must be larger than the average yellow-white type and have a larger surface temperature.

"It must be larger and hotter because, though it's far away, it is hot enough to keep the northern hemisphere of this planet in a semitropical condition.

"The sun was quite a bit north at midday, but now its swinging back to the south. I'd say offhand the planet must be tilted at about forty degrees, which means there's a cold winter coming up, though that doesn't fit with the age and type of the vegetation."

The Lady Laurr was frowning. "It doesn't seem very helpful," she said. "But, of course, I'm only an executive."

"And I'm only a meteorologist."

"Exactly. Come in. Perhaps my astrophysicist can make something of it."

"*Your* astrophysicist!" said Maltby. But he didn't say it aloud.

He followed her into the segment of ship and closed the door.

Maltby examined the interior of the main bridge with a wry smile as the young woman seated herself before the astroplate.

The very imposing glitter of the instrument board that occupied one entire wall was ironical now. All the machines it had controlled were far away in space. Once it had dominated the entire Lesser Magellanic Cloud; now his own hand gun was a more potent instrument.

He grew aware that Lady Laurr was looking up at him.

"I don't understand it," she said. "They don't answer."

"Perhaps"—Maltby could not keep the faint sardonicism out of his tone—"perhaps they may really have had a good reason for wanting you to call at 010 hours."

The woman made a faint, exasperated movement with her facial muscles but she did not answer. Maltby went on coolly:

"After all, it doesn't matter. They're only going through routine motions, the idea being to leave no loophole of rescue unlooked through. I can't even imagine the kind of miracle it would take for anybody to find us."

The woman seemed not to have heard. She said, frowning:

"How is it that we've never heard a single Fifty Suns broadcast? I intended to ask about that before. Not once during our ten years in the Lesser Cloud did we catch so much as a whisper of radio energy."

Maltby shrugged. "All radios operate on an extremely complicated variable wave length—changes every twentieth of a second. Your instruments would register a tick once every ten minutes, and—"

He was cut off by a voice from the astroplate. A man's face was there—Acting Grand Captain Rutgers.

"Oh, there you are, captain," the woman said. "What kept you?"

"We're in the process of landing our forces on Cassidor VII," was the reply. "As you know, regulations require that the grand captain—"

"Oh, yes. Are you free now?"

"No. I've taken a moment to see that everything is right with you, and then I'll switch you over to Captain Planston."

"How is the landing proceeding?"

"Perfectly. We have made contact with the government. They seem resigned. But now I must leave. Goodby, my lady."

His face flickered and was gone. The plate went blank. It was about as curt a greeting as anybody had ever received. But Maltby, sunk in his own gloom, scarcely noticed.

So it was all over. The desperate scheming of the Fifty Suns leaders, his own attempt to destroy the great battleship, proved futile against an invincible foe.

For a moment he felt very close to the defeat, with all its implications. Consciousness came finally that the fight no longer mattered in his life. But the knowledge failed to shake his dark mood.

He saw that the Right Honorable Gloria Cecily had an expression of mixed elation and annoyance on her fine, strong face; and there was no doubt that she didn't *feel*—disconnected—from the mighty events out there in space. Nor had she missed the implications of the abruptness of the interview.

The astroplate grew bright and a face appeared on it—one that Maltby hadn't seen before. It was of a heavy-jowled, oldish man with a ponderous voice that said:

"Privilege your ladyship—hope we can find something that will enable us to make a rescue. Never give up hope, I say, until the last nail's driven in your coffin."

He chuckled; and the woman said: "Captain Maltby will give you all the information he has, then no doubt you can give him some advice, Captain Planston. Neither he nor I, unfortunately, are astrophysicists."

"Can't be experts on every subject," Captain Planston puffed. "Er, Captain Maltby, what do you know?"

Maltby gave his information briefly, then waited while the other gave instructions. There wasn't much:

"Find out length of seasons. Interested in that yellow effect of the sunlight and the deep brown. Take the following photographs, using orthosensitive film—use three dyes, a red sensitive, a blue and a yellow. Take a spectrum reading—what I want to check on is that maybe you've got a strong blue sun there, with the ultraviolet barred by a heavy atmosphere, and all the heat and light coming in on the yellow band.

"I'm not offering much hope, mind you—the Lesser Cloud is packed with blue suns—five hundred thousand of them brighter than Sirius.

"Finally, get that season information from the natives. Make a point of it. Good-by!"

The native was wary. He persisted in retreating elusvely into the jungle; and his four legs gave him a speed advantage of which he seemed to be aware. For he kept coming back, tantalizingly.

The woman watched with amusement, then exasperation.

"Perhaps," she suggested, "if we separated, and I drove him toward you?"

She saw the frown on the man's face as Maltby nodded reluctantly. His voice was strong, tense.

"He's leading us into an ambush. Turn on the sensitives in your helmet and carry your gun. Don't be too hasty about firing, but don't hesitate in a crisis. A spear can make an ugly wound; and we haven't got the best facilities for handling anything like that.

His orders brought a momentary irritation. He seemed not to be aware that she was as conscious as he of the requirements of the situation.

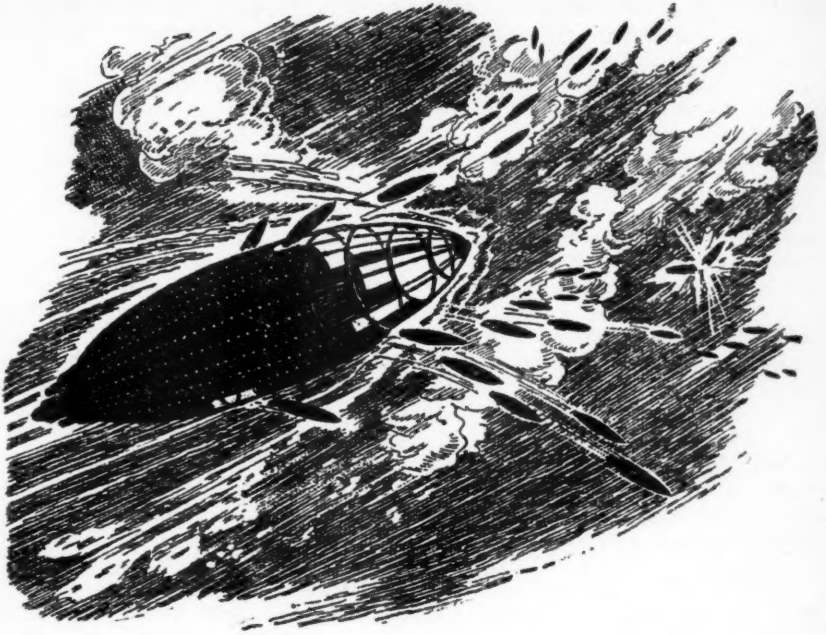
The Right Honorable Gloria sighed. If they had to stay on this planet there would have to be some major psychological adjustments, and not—she thought grimly—only by herself.

"Now!" said Maltby beside her, swiftly. "Notice the way the ravine splits in two. I came this far yesterday and they join about two hundred yards farther on. He's gone up the left fork. I'll take the right. You stop here, let him come back to see what's happened, then drive him on."

He was gone, like a shadow, along a dark path that wound under thick foliage.

Silence settled.

She waited. After a minute she felt herself alone in a yellow and black world that had been lifeless since time began.



She thought: This was what Maltby had meant yesterday when he had said she wouldn't dare shoot him—and remain alone. It hadn't penetrated then.

It did now. Alone, on a nameless planet of a mediocre sun, one woman waking up every morning on a moldering ship that rested its unliving metal shape on a dark, muggy, yellow marsh land.

She stood somber. There was no doubt that the problem of robot and human being would have to be solved here as well as out there.

A sound pulled her out of her gloom. As she watched, abruptly more alert, a catlike head peered cautiously from a line of bushes a hundred yards away across the clearing.

It was an interesting head; its ferocity not the least of its fascinating qualities. The yellowish body was invisible now in the underbrush, but she had caught enough glimpses of it earlier to recognize that it was the CC type, of the almost universal Centaur family. Its body was evenly balanced between its hind and forelegs.

It watched her, and its great glistening black eyes were round with puzzlement. Its head twisted from side to side, obviously searching for Maltby.

She waved her gun and walked forward. Instantly the creature disappeared. She could hear it with her sensitives, running into distance. Abruptly, it slowed; then there was no sound at all.

"He's got it," she thought.

She felt impressed. These two-brained Mixed Men, she thought, were bold and capable. It would really be too bad if antirobot prejudice prevented them from being absorbed into the galactic civilization of Imperial Earth.

She watched him a few minutes later, using the block system of communication with the creature. Maltby looked up, saw her. He shook his head as if puzzled.

"He says its always been warm like this, and that he's been alive for thirteen hundred moons. And that a moon is forty suns—forty days. He wants us to come up a little farther along this valley, but that's too transparent for comfort. Our move is to make a cautious, friendly gesture, and—"

He stopped short. Before she could even realize anything was wrong, her mind was caught, her muscles galvanized. She was thrown sideways and downward so fast that the blow of striking the ground was pure agony.

She lay there stunned, and out of the corner of her eye she saw the spear plunge through the air where she had been.

She twisted, rolled over—her own free will now—and jerked her gun in the direction from which the spear had come. There was a second centaur there, racing away along a bare slope. Her finger pressed on the control; and then—

"Don't!" It was Maltby, his voice low. "It was a scout the others sent ahead to see what was happening. He's done his work. It's all over."

She lowered her gun and saw with annoyance that her hand was shaking, her whole body trembling. She parted her lips to say: "Thanks for saving my life!" Then she closed them again. Because the words would have quavered. And because—

Saved her life! Her mind poised on the edge of blankness with the shock of the thought. Incredibly—she had never before been in personal danger from an individual creature.

There had been the time when her battleship had run into the outer fringes of a sun; and there was the cataclysm of the storm, just past.

But those had been impersonal menaces to be met with technical virtuosities and the hard training of the service.

This was different.

All the way back to the segment of ship she tried to fathom what the difference meant.

It seemed to her finally that she had it.

"Spectrum featureless." Maltby gave his findings over the astro. "No dark lines at all; two of the yellow bands so immensely intense that they hurt my eyes. As you suggested, apparently what we have here is a blue sun whose strong violet radiation is cut off by the atmosphere.

"However," he finished, "the uniqueness of that effect is confined to our planet here, a derivation of the thick atmosphere. Any questions?"

"No-o!" The astrophysicist looked thoughtful. "And I can give you no further instructions. I'll have to examine this material. Will you ask Lady Laurr to come in? Like to speak to her privately, if you please."

"Of course."

When she had come, Maltby went outside and watched the moon come up. Darkness—he had noticed it the previous night—brought a vague, overall violet haze. Explained now!

An eighty-degree temperature on a planet that, the angular diameter of the sun being what it was, would have been minus one hundred eighty degrees, if the sun's apparent color had been real.

A blue sun, one of five hundred thousand— Interesting but— Maltby smiled savagely—Captain Planston's "No further instructions!" had a finality about it that—

He shivered involuntarily. And after a moment tried to picture himself sitting, like this, a year hence, staring up at an unchanged moon. Ten years, twenty—

He grew aware that the woman had come to the doorway and was gazing at him where he sat on the chair.

Maltby looked up. The stream of white light from inside the ship caught the queer expression on her face, gave her a strange, bleached look after the yellowness that had seemed a part of her complexion all day.

"We shall receive no more astroradio calls," she said and, turning, went inside.

Maltby nodded to himself, almost idly.

It was hard and brutal, this abrupt cutting off of communication. But the regulations governing such situations were precise.

The marooned ones must realize with utter clarity, without false hopes and without the curious illusions produced by radio communication, that they were cut off forever. Forever on their own.

Well, so be it. A fact was a fact, to be faced with resolution. There had been a chapter on castaways in one of the books he had read on the battleship. It had stated that nine hundred million human beings had, during recorded history, been marooned on then undiscovered planets. Most of these planets had eventually been found; and on no less than ten thousand of them great populations had sprung from the original nucleus of castaways.

The law prescribed that a castaway could not withhold himself or herself from participating in such population increases—regardless of previous rank. Castaways must forget considerations of sensitivity and individualism, and think of themselves as instruments of race expansion.

There were penalties; naturally inapplicable if no rescue was effected, but ruthlessly applied whenever recalcitrants were found.

Conceivably the courts might determine that a human being and a robot constituted a special case.

Half an hour must have passed while he sat there. He stood up finally, conscious of hunger. He had forgotten all about supper.

He felt a qualm of self-annoyance. Damn it, this was not the night to appear to be putting pressure on her. Sooner or later she would have to be convinced that she ought to do her share of the cooking.

But not tonight.

He hurried inside, toward the compact kitchen that was part of every segment of ship. In the corridor, he paused.

A blaze of light streamed from the kitchen door. Somebody was whistling softly and tunelessly but cheerfully; and there was an odor of cooking vegetables, and hot *lak* meat.

They almost bumped in the doorway. "I was just going to call you," she said.

The supper was a meal of silences, quickly over. They put the dishes into the automatic and went and sat in the great lounge; Maltby saw finally that the woman was studying him with amused eyes.

"Is there any possibility," she said abruptly, "that a Mixed Man and a human woman can have children?"

"Frankly," Maltby confessed, "I doubt it."

He launched into a detailed description of the cold and pressure process that had molded the protoplasm to make the original Mixed Men. When he finished he saw that her eyes were still regarding him with a faint amusement. She said in an odd tone:

"A very curious thing happened to me today, after that native threw his spear. I realized"—she seemed for a moment to have difficulty in speaking—"I realized that I had, so far as I personally was concerned, solved the robot problem.

"Naturally," she finished quietly, "I would not have withheld myself in any event. But it is pleasant to know that I like you without"—she smiled—"qualifications."

Blue sun that looked yellow. Maltby sat in the chair the following morning puzzling over it. He half expected a visit from the natives, and so he was determined to stay near the ship that day.

He kept his eyes aware of the clearing edges, the valley rims, the jungle trails, but—

There was a law, he remembered, that governed the shifting of light to other wave bands, to yellow for instance. Rather complicated, but in view of the fact that all the instruments of the main bridge were controls of instruments, not the machines themselves, he'd have to depend on mathematics if he ever hoped to visualize the kind of sun that was out there.

Most of the heat probably came throught the ultraviolet range. But that was uncheckable. So leave it alone and stick to the yellow.

He went into the ship. Gloria was nowhere in sight, but her bedroom door was closed. Maltby found a notebook, returned to his chair and began to figure.

An hour later he stared at the answer: One million three hundred thousand million miles. About a fifth of a light year.

He laughed curtly. That was that. He'd have to get better data than he had or—

Or would he?

His mind poised. In a single flash of understanding, the stupendous truth burst upon him.

With a cry he leaped to his feet, whirled to race through the door as a long, black shadow slid across him.

The shadow was so vast, instantly darkening the whole valley, that, involuntarily, Maltby halted and looked up.

The battleship *Star Cluster* hung low over the yellow-brown jungle planet, already disgorging a lifeboat that glinted a yellowish silver as it circled out into the sunlight, and started down.

Maltby had only a moment with the woman before the lifeboat landed. "To think," he said, "that I just now figured out the truth."

She was, he saw, not looking at him. Her gaze seemed far away. He went on:

"As for the rest, the best method, I imagine, is to put me in the conditioning chamber, and—"

Still without looking at him, she cut him off:

"Don't be ridiculous. You must not imagine that I feel embarrassed because you have kissed me. I shall receive you later in my quarters."

A bath, new clothes—at last Maltby stepped through the transmitter into the astrophysics department. His own first realization of the tremendous truth, while generally accurate, had lacked detailed facts.

"Ah, Maltby!" The chief of the department came forward, shook hands. "Some sun you picked there—we suspected from your first description of the yellowness and the black. But naturally we couldn't rouse your hopes—Forbidden, you know.

"The axial tilt, the apparent length of a summer in which jungle trees of great size showed no growth rings—very suggestive. The featureless spectrum with its complete lack of dark lines—almost conclusive. Final proof was that the orthosensitive film was overexposed, while the blue and red sensitives were badly underexposed.

"This star-type is so immensely hot that practically all of its energy radiation is far in the ultravisible. A secondary radiation—a sort of fluorescence in the star's own atmosphere—produces the visible yellow when a minute fraction of the appalling ultraviolet radiation is transformed into longer wave lengths by helium atoms. A fluorescent lamp, in a fashion—but on a scale that is more than ordinarily cosmic in its violence. The total radiation reaching the planet was naturally tremendous; the surface radiation, after passing through miles of absorbing ozone, water vapor, carbondioxide and other gases, was very different.

"No wonder the native said it had always been hot. The summer lasts four thousand years. The normal radiation of that special appalling star type—the æon-in-æon-out radiation rate—is about equal to a full-fledged Nova at its catastrophic maximum of violence. It has a period of a few hours, and is equivalent to approximately a hundred million ordinary suns. Nova O, we call that brightest of all stars; and there's only one in the Lesser Magellanic Cloud, the great and glorious S-Doradus.

"When I asked you to call Grand Captain Laurr, and I told her that out of thirty million suns she had picked—"

It was at that point that Maltby cut him off. "Just a minute," he said, "did you say you told Lady Laurr *last night?*"

"Was it night down there?" Captain Planston said, interested. "Well, well— By the way, I almost forgot—this marrying and giving in marriage is not so important to me now that I am an old man. But congratulations."

The conversation was too swift for Maltby. His minds were still examining the first statement. That she had known all the time. He came up, groping, before the new words.

"Congratulations?" he echoed.

"Definitely time she had a husband," boomed the captain. "She's been a career woman, you know. Besides, it'll have a revivifying effect on the other robots . . . pardon me. Assure you, the name means nothing to me.

"Anyway, Lady Laurr herself made the announcement a few minutes ago, so come down and see me again."

He turned away with a wave of a thick hand.

Maltby headed for the nearest transmitter. She would probably be expecting him by now.

She would not be disappointed.

THE END.

The Analytical Laboratory

It's been some time since I explained the method used in deriving the numerical point scores given the stories in the Lab analysis; for the benefit of those who have started reading since that time and may be interested, I'll review it.

Briefly, readers' letters rating the stories in order of preference are the basis. Each letter's votes are entered on a chart; if a letter voted "Judgment Night" best, "One-Way Trip" second, "Mutant's Brother" third, and so on, "Judgment Night" would get one point, "One-Way Trip" two points, and so on.

Not every reader letter casts votes on all the stories; thus the total number of votes cast for a particular story may not equal the total number of ballot letters. The point score of each story is determined, when the Analytical Laboratory must be closed, by dividing the sum of the points a story has gotten by the number of votes actually cast for the story. Naturally, the more readers' letters I get to base this calculation on, the more correctly it represents the general opinion. It doesn't take a letter—a post card listing the stories in order of merit will help and will be appreciated. How about registering your praise and/or grouses?

RATINGS FOR AUGUST ISSUE

Place	*Story*	*Author*	*Points*
1.	Judgment Night	C. L. Moore	1.20
2.	One-Way Trip	Anthony Boucher	2.05
3.	The Mutant's Brother	Fritz Leiber, Jr.	3.30
4.	Endowment Policy	Lewis Padgett	3.35
5.	M33 In Andromeda	A. E. van Vogt	3.55

THE EDITOR.

Tidal Waves

by Malcolm Jameson

Tidal waves—stupendous waves representing a sheer tonnage of water beyond human appreciation—roll over the Earth frequently. In fact—twice a day. The basic cause is simple enough, but the Earth's ragged surface makes them enormously complex things, not at all the simple peaks books usually show—

Illustrated by Hall

TIDAL WAVE STRIKES NEW YORK CITY

Jersey Lowlands Inundated!

A terrible catastrophe?

Not a bit of it.

It happened last night. It will happen again tomorrow—twice. It has been happening daily for years and years—since long before Hendrik Hudson sailed into the Bay, since even the day when Pilot Noah stranded his *Ark* on the summit of Ararat. People are used to it; they even depend on it. No one is ever hurt and property is seldom damaged. Tidal waves are just not as bad as a lot of people think they are.

The tidal wave of fiction, the darling of the journalist and headline writer, is a cat of another stripe. All it has in common with the true tidal wave is that both are made of water. The very word tidal connotes an enduring rhythm—a steady rising and falling, a swelling and subsiding, an ebb and flow. The false tidal waves of the press are one-shot affairs, rare, random and rhapsodic. They come once, as if out of the blue, do their damage, and die away. The time and place of their coming, and their size, is unpredictable, whereas the true tides run on schedules that may be predicted for years in advance, to the hour and minute of their appearance at a given place and to within an inch or so of their height. For they are generated by the Moon and Sun, and, except as modified by local earthly conditions, are as dependable as any other celestial phenomenon.

Almost all the notorious misnamed tidal waves on record were the result of sharp Earth shocks. Such was the one attendant on the great Lisbon earthquake of 1755, and again at the explosion of Krakatoa in 1883, when the sea was hurled away for a mile or so only to return with a violent rush. Another instance was when terrifying giant waves came rolling in out of a windless and cloudless Caribbean Sea to pick up and toss onto Santo Domingo's cliffs the old armored cruiser *Memphis*. But though there were these and others, and undoubtedly more to come, there is nothing tidal about their origin or behavior.

It is erroneous also to attribute disasters such as the Galveston storm of 1900 to tidal waves, though admittedly tidal waves may play a part. When onshore winds blow persistently for days on end, the waters of the sea pile up along the coast as soup does against the lip of a bowl when blown upon to cool. During those days of abnormally high water the tides will come and go as usual, adding their crests. If, at one of the high tides, a hurricane blows up to stir the waters, destruction follows. It was the hurricane after the preceding easterly gales that demolished Galveston and drove ships high and dry nine miles inland; the contribution of the tide was negligible, since the average range there is but one foot.

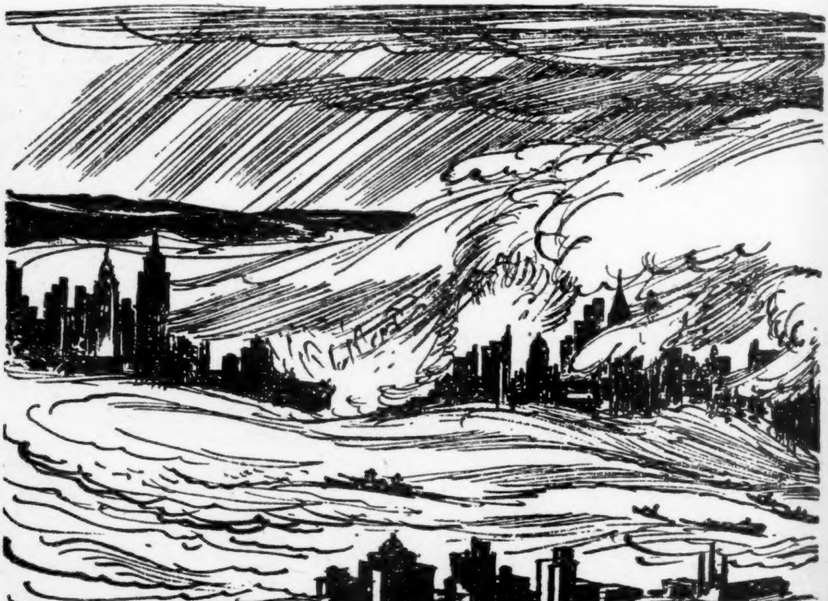
With due respect to the damaging power of these random waves, they are quite petty as compared with the genuine article. The tidal wave is a truly grand phenomenon, being the largest wave that can be formed and sustained on this planet of ours. For its length—in theory—is half a circumference at the equator, and it has—also in theory—the astonishing speed of one thousand and twenty-four miles an hour. Its period is equally majestic, being twelve hours and twenty-five minutes between the passage of one of its crests and the arrival of the next. Yet despite these facts most of us remain unimpressed. That is not unreasonable, because we perceive these waves only as an exceedingly slow vertical pulsation of but a few feet in amplitude—usually less than half a dozen. To grasp the concept of the tidal wave in its entirety it is necessary to resort to theory, and before theory can be formulated data is required. And there's the rub.

The tides remind one of the fable of the blind men and the elephant. The fishermen of New Brunswick will tell you that the tides are fearsome things, rushing in as a tumbling wall of water and filling up the Bay of Fundy to a depth of fifty feet or more; and the master of a Ning Po junk will concur—he has seen ships overturned in the Hai-chu-fu. A Panamanian living in Colon will say that they are nothing—a scant foot, while his fellow countryman a few miles away on the Pacific side takes a more serious view. His tides are twelve or thirteen feet. A Neapolitan may have never heard of them. And there is equal divergence in opinion as to collateral currents. In the Pentland Skerries they are strong and erratic, forming whirlpools that suddenly form and as suddenly vanish, but on a South Sea island they may be absent or too weak to notice. Similarly the times of arrival of the tides vary. At New York City high tide follows the Moon by a little over eight hours, while at Albany, on the same meridian, high tide does not come until nine hours later—long after the main tidal wave has gone on south and west into the Gulf of Mexico. What we actually see of the tidal wave is its ragged fringe, retarded, distorted and reflected by the land and bottom formation about us. Only the lakes obey the Moon directly, with their strange "seiches" or drumheadlike pulsations.

The theory of the tides is deceptively simple. Or rather that portion of it taught in the elementary schools, for few, except earnest scholars, venture deeper into it than the static picture. Once one tackles the dynamic aspects and tries to reconcile them with known tidal data, he also becomes a promising contender for the paper-dolly-cutting championship. Moreover the dynamic theory of the tides is not only abstruse and complex, but nearly useless, the surface of the Earth being what it is.

Everybody remembers the static explanation. We were shown a diagram with the Sun, Moon and Earth neatly lined up in a row, the first two being depicted as circles while the Earth is portrayed as a lens-shaped object resembling the human eye. Of that eye the round iris represents the solid core and the elliptical sideways extensions the water masses humped up directly beneath the Moon and on the antipodal side. The teachers told us that it was the attraction of the Sun and Moon that pulled the water up that way. What bothered me for a long while was how any sort of attraction could *drag* water up into a pile where closest to it and yet *push* it up into a pile where more distant. But the teachers insisted that that was the way it was, and that when the Sun and Moon pulled together we had the highest or "spring" tides, and that when they bucked each other at right angles we had the lowest or "neap" tides, the first coming with the full and new moons and the other on the quarters. It was years before the distinction between the attractive force of gravity and the tide-raising force of the same mass became clear.

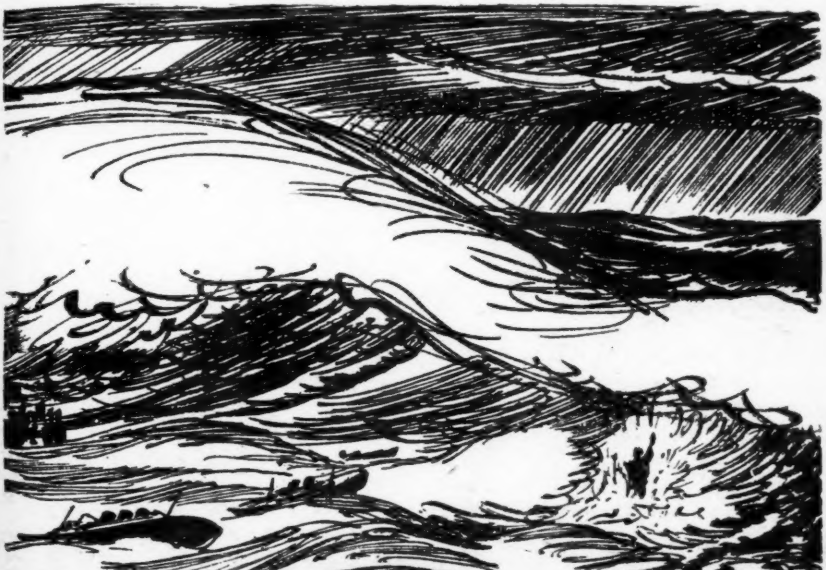
They *are* the same thing; the difference is the way you figure it. But what a difference! The ordinary grapnel of gravity that holds heavenly bodies in orderly relationship varies in strength inversely as the square of the distance between them—figured from center to center. When they are close enough for disruptive forces to be worth considering, distances are figured not from center to center, but separately from the center of the disrupting body to more and less distant parts of the victim body. When the radius of the victim body is small in comparison to the distance to the disturbing one, it works out that disruptive forces vary inversely as the *cube* of the distance. For this reason, though the Moon has only one two hundredth the attractive power of the Sun, it has two and a half times the lifting power at the surface of the Earth, thus giving it predominance as a tidemaker. The actual amount of lift seems small, amounting to only one pound of lightening in four thousand tons of Earth matter, but it is enough to pull the surface of the ocean up about two feet. That explains the hump at the sublunar point, which is also added to by the sum of tangential pulls applied to the water ninety degrees every way from the perpendicular. But the center of the Earth's core also re-



ceives a tug, though less severe, and it moves moonward a trifle, leaving the water on the offside to trail along. To put it clumsily, the antipodal water is not pushed or pulled out there at all; the bottom is yanked part way out from under it and it is just left hanging there!

Very well; there is the ideal tidal wave in the static picture. It is not quite symmetrical, for the sublunar segment is a trifle higher than the antipodal. Now, if we release the three heavenly bodies from their fixed pose and allow them to continue their customary gyrations, we can imagine this wave rushing around a smooth, spherical Earth, keeping pace with the Moon racing overhead, and causing an even undulation everywhere, modified only by the ripple in its profile as the solar component is large or small with the phases of the Moon. This is a very simple explanation of the tide, but it is only the beginning. Since the Earth is tilted in its orbit, the Sun wanders north and south throughout the year. The Moon's declination varies in like manner and for similar reasons, though over a wider range and at a more rapid rate. These apparent movements of the tide-generating bodies cause the highest point of the tidal wave crest to fluctuate from one side of the equator to the other, or cause two separate high points. The Sun also travels faster through the heavens and therefore repeatedly overtakes the Moon and passes it. Correspondingly the solar portion of the tidal wave rides up on the back of the lunar one, and as it approaches the higher crest retards it. When this happens the tide is said "to lag." Once the two crests are joined and part again the reverse occurs and the tidal wave is speeded up for a day or so. Its arrival a few minutes ahead of scheduled time is called "priming."

In addition to these deviations from the ideal wave, the level is higher or lower depending on the position of the Earth and Moon in their respective or-



bits. Since neither orbit is circular, the distance between the Earth and Moon, and the Earth and Sun is continually varying, and as it does so does the tide-raising forces vary. All other things being equal, the maximum lunar tides appear when the Moon is at perigee, the maximum solar ones at perihelion. The combination produces the highest tides we can have.

The above variations possess some complexity, but they are the result of regularly operating natural laws and can be predicted in detail. Not so the ones arising from the irregularities of the ocean bed. To begin with, it is physically impossible for the tidal wave to keep pace with the Moon. The shallowness of the seas prevents it. The ocean would have to have a uniform depth of thirteen miles of water to allow a wave to travel at the speed required—a depth found nowhere, the average ocean depth being no more than three miles, with many areas far more shoal. For this reason the Moon soon outstrips the waves it generates and goes on ahead to generate others—perhaps two or three before the cycle is begun over. The multiplicity of waves, deformed as they are by the configurations of the land and ocean bottom, and in some instances overlapping, causes an immense amount of local tidal confusion that can only be untangled by the correlation of data observed at thousands of separate points. The special conditions that exist almost everywhere completely upset theoretical calculations. The only way to know when and how the tide will arrive at a given spot is to go there and make observations for at least a month.

The most important thing to know is *when* the tide arrives. Once this is learned, the "port" is said to be "established"—port meaning any spot whatever, regardless whether it is one in the commercial sense, or even an inhabited place. It will be found that the higher of the two daily high tides will invariably arrive so many hours and minutes after the meridian transit of the Moon. This is a constant for any particular location, and is modified only by the lagging and priming of the Sun already mentioned. This period is called the lunitidal interval. Once it is determined, the making of tide tables is hardly more than a matter of looking up the ephemerides of the Moon in the almanac and converting lunar into mean solar time. Since the lunar day is fifty minutes longer than the civil day, each successive tide appears to lag twenty-five minutes behind its predecessor.

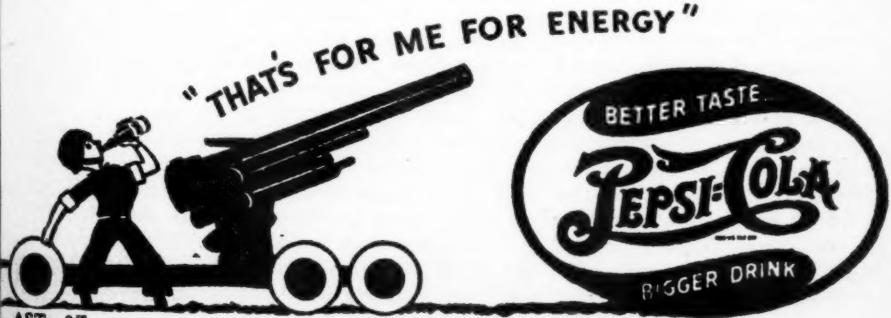
If it were possible to have as our "port" a stake driven in mid-ocean, it would be found that after the stand of the high water, the level would begin to fall very gradually until at the end of six hours it would have dropped about two feet to the low water stand. Then it would rise again. In mid-ocean there would be little or no current, and what there was of it might come from any point of the compass, or perhaps from all in succession in a sort of rotary motion. Incidentally, though tidal heights and tidal currents are related, they are not the same thing, and do not necessarily coincide. In fact, they rarely do in narrow waters, for reasons that will be seen shortly. The distinction in terms is as follows: considering height of water only, the tide rises from the low water stand to the high stand, then falls to low water again; the corresponding terms applied to the incidental currents are "low slack water" when the currents stop momentarily before reversal, then "flood" tide, as the current runs inshore, and 'high slack." After the high slack, the current "ebbs" until low water slack is reached again. A tidal current may continue to run for hours after high or low water level has been reached and passed.

Having established a number of ports throughout the world, it is possible to chart approximately the course of the major tidal waves. Since the pinnacle of the spring tides theoretically coincide with the new and full moons, we should expect to find the highest tides of the month on those days. Actually we do not, except along the Pacific coast of the Americas. In the North Atlantic they do not come until a day or so later. From that it would appear reasonable to regard the Chilean tidal wave as the No. 1 or parent wave, and a glance at a world map will show why that is so. Nowhere else could a world-wide wave get off to as good a start and run so far before meeting obstacles, though even this one begins to have troubles before many hours have passed. The complementary or antipodal segment of this wave also has the best opportunity, since it extends from Antarctica to Sumatra without a break, being just to the west of Australia in the Indian Ocean.

The Chilean wave stretches from near the South Pole to Central America, a distance of five thousand miles, and as it sweeps out into the Pacific, additional segments father north set out to join it, until by mid-Pacific the wave runs from one polar circle to the other, though probably it has a ragged front due to the uneven starting time of portions of it. But soon the northern half finds itself in difficulties. It strikes the Asiatic mainland and is reflected in various directions, and eventually is shunted to the southwestward toward the islands of Malaysia. The southern half likewise meets obstacles, being sheared in two by Australia, the northern part being largely dissipated in the mazes of the many little seas and straits of the East Indies. Only the extreme southern wing marches on, though laggingly, into the Indian Ocean. By the time it has reached the Cape of Good Hope it is far behind schedule, for by then the Moon has finished one complete circuit of the Earth and gone on to overtake its wave of yesterday. Somewhere in this part of the world it passes it, giving it a reminding tug as it does, and the rejuvenated wave goes on into the Atlantic. There it is blocked by South America and forced northward, where it eventually dies in the Arctic, several days behind schedule.

This is a very sketchy picture and no doubt open to challenge, but it is meant to illustrate the contortions that are forced upon a grand wave that started out sublimely. That wave, having been formed and set in motion, would have to run its course, though it could not keep pace with the Moon that made it. On the other hand, wherever the Moon went ahead of it, there is a tendency for other waves to form and be dissipated without regard for the initial grand wave, as do the microscopic ones observed in the larger lakes. The possibilities for complications in the separate and crooked oceans are limitless. That is why theory can explain, after all the facts have been recorded, but not predict.

To take but one instance, it may be of interest to have a look at how the tide comes to North America. Now, the dif-



ference in longitude between Maine and Florida is about fifteen degrees, just an hour's run in the skies of the Sun or Moon. The tidal wave, being a creature of both, could be expected to wash those same coasts progressively within that hour. It does. But only as regards the exposed points. Wherever extended shoals have to be crossed, or narrow entrances negotiated, the tide becomes tardy.

The tidal wave comes in from the Atlantic and strikes Block Island and New Bedford and Atlantic City at almost the same moment. That is a trifle over seven hours after the Moon has passed. Within the hour it will touch Sandy Hook and Cape May at the ends of New Jersey, and Charleston, South Carolina. By the end of the hour it will have reached the Battery at the foot of Manhattan Island and Savannah, Georgia; in an hour more Jacksonville and Key West in Florida. In view of the wide shoals eastward of New England and the Bahamas blanketing the south end of Florida, what little divergence from the ideal time schedule there is is understandable. It is when we go inside the capes and see what happens in the bays and rivers that we toss the world timetable out the window.

About New York City there is a situation that invariably gives rise to erratic tidal behavior wherever found—the existence of a considerable body of water open at both ends. Such a one is the North Sea, and the English Channel, and all the many seas in the Dutch East Indies. In these double-ended bodies extremely complex conditions may be encountered—they may be flooding from both ends at once, or flooding from one and ebbing at the other, or with the tides overlapping in a great variety of ways. Queer and unexpected reversal of currents take place, and there may be several successive high tides close together when there should be but one. The Isle of Wight is located in a flat "V" and gets the same tide from two directions—through the Solent and Spithead—in quick succession.

At New York City we have Long Island Sound connected to the East River by Hell Gate, and each open to the sea by other routes. The two together make an "L"-shaped body of water at whose seagates the main tidal wave arrives at approximately the same time, though the two entrances are nearly two hundred miles apart. The behavior of the tide here resembles somewhat that in the English Channel. High water is reached progressively along the length of the Sound, and also up New York Harbor and into the tributary rivers as is to be expected. The timetable at the western entrance is as follows: Sandy Hook first, the Battery thirty-five minutes later, and Hell Gate two hours and thirty minutes after Sandy Hook. All this time a strong flood current is pouring through the Narrows and a branch of it up the East River, out through Hell Gate and into the Sound, though long before high water is reached at Hell Gate the level has begun to fall at Sandy Hook. A similar current is flowing westward through the Sound.

The curious thing about this performance is that the two currents are flowing *toward each other,* and meet head on at Throg's Neck, a small promontory in the Sound a little way east of Hell Gate. There, there is no current, though for miles each way there is plenty, hurrying to the rendezvous. After a time both currents stop suddenly, *throughout their entire length,* just as all the cars of a train stop when the locomotive stops. High slack water comes all along the East River and in most of Long Island Sound at the same time. Then the currents reverse themselves and flow *away* from Throg's Neck and go back.

It may be of interest to note here that though two hours elapse between high waters at the Battery and Hell Gate, a scant seven miles apart, there is only one hour and a quarter difference in the times of high tide at New Bedford, Massachusetts, and Savannah, Georgia. This shows clearly the impeding effect of narrow channels and shallow bottoms. The free tidal wave travels at a rate of hundreds of miles an hour.

There is still another branch of New York Harbor—the Hudson River. This is a blind alley, so to speak, and nothing that happens in the Sound has any relation to it, though the East River is connected to the Hudson by the little Harlem River and there is a spot where they meet known as Spuyten Duyvil where violent commotions take place owing to the lack of synchronism of the tides on either side of Manhattan. But the individualism of tidal behavior is best seen by jumping up to Albany. High water reaches there just nine hours after it has passed the Battery; while at Poughkeepsie, on the way up, at four and a half hours. Thus the lunitidal interval at Albany is over seventeen hours against the Battery's eight and a little over, and Poughkeepsie's in between. By the time it is high tide at Albany, the wave of which it is an offshoot has long since departed from the Atlantic Coast, and its successor is more than halfway on the make. Yet all these places are virtually on the same meridian! Perhaps as the Moon passes overhead there is an imperceptible seiche in the Hudson of the order of a millimeter, but the only tide that is felt is backwash of the hugh ocean tidal wave—and that comes nearly three days late.

In a body like Chesapeake Bay there are differing phenomena. It is large and deep inside, and has many wide tributaries, though its mouth is narrow and shoal. It requires hours for the bay to fill up, and at its entrance we find a strong flood tide still running, though the water level is falling in the lower bay. Between Cape Henry and Baltimore there are many small rivers that will have passed their high tides and be emptying long before it is high tide farther up, giving rise to crosscurrents known as tiderips. Tiderips are highly annoying to navigators, especially in thick weather when they may not be noticed, for where the ship is there may be a strong set northward while only a hundred yards away there is a countercurrent running equally strongly in some other direction. Tide tables and chronometers are little help when a matter of a few dozen yards in position makes all the difference.

There is also a goodly quantity of water moved upstream in a body like the Chesapeake, and it all has to come down again. It does that in the form of a reflected wave, thus causing double-headed tides at places between the entrance and the uppermost points, and there may be double slacks to correspond. And since not only all the tidal sea water that came in, but the fresh water from the rivers has to go out, there is usually a marked inequality in the duration of the floods and ebbs. More water goes out than ever comes in, therefore it takes longer to evacuate it. In other localities there is but one tide a day, due to special causes; till elsewhere there may not be any for weeks. In the Gulf, for example, tidal ranges are small, being about a foot, so that at normal stages of the Mississippi New Orleans will have a tide of about that height. When the river is in rise there are no tides.

The filling and emptying of large bays is felt far out at sea. In the deep water of the ocean there is very little actual translation of water, the tidal wave being propagated by the orbital motion of drops just as are other waves. But closer to shore an immense volume of water is moved. When Chesapeake or Delaware Bays are flooding, there is an inward draft of water that may be noticeable thirty or forty miles beyond their entrance capes, and a reverse condition paralleling the ebb. A ship proceeding along the coast at such a time may very well bet set miles off its course by the sidewise current, and if the weather is foggy, not suspect it. Small wonder that many ships pile up on the Jersey shores, or that even experienced mariners willingly receive pilots in waters unfamiliar to them.

The height and violence of tides is determined solely by local topography. Converging shores, as in the "V"-shaped estuaries of the Bay of Fundy and the Bristol Channel, cramp the incoming wave and convert its volume into height. The range at Bristol is fifty feet, whereas directly across the Irish Sea along the flat coast of Ireland the range is only the standard two feet. Since both tides are manifestations of the identical tidal wave, it is obvious that it is the narrowing of the channel that causes the higher tides. Shoaling will also convert momentum into velocity, so that not only will the tides be higher in such places, but come in at dangerous and frightening speeds.

The most spectacular of tidal forms is probably the "bore" or "eagre." These are found when waves of the above nature enter the mouths of rivers carrying strong seaward currents of fresh water. The volume of incoming water is greater than the river can receive without disturbance, with the result that the tide advances as a tumbling white wave from three to twelve feet high, tossing about and overturning small craft as it comes. This phenomenon is found anywhere the conditions are right—in the Solway and Severn of England, the Seine of France, the Amazon, the Bramahputra, the Yangtze Kiang and other rivers. It is not a haphazard catastrophe, but a daily event.

Instead of fearing the tides, man utilizes them. To do that he studies them. The first tool is the tide gauge, a sheltered measuring stick unaffected by waves and ripples, by which the exact rise and fall is observed at all phases of the Moon. From these data it is possible to compute the various mean water levels, of which there are several. Harbor soundings are meaningless unless referred to some dependable plane of reference. That is mean low water, and the mean low water line is also the line of demarcation between private property and the public domain. Critical channels may have their depths charted as of "extreme" low water, so that the mariner will be assured of a minimum depth whatever the stage of the tide. Mean high water is of interest to those constructing waterside buildings, wharves and quays, so that the working levels of those will be high enough to escape flooding. And lastly there is the establishment of that valuable fiction "sea level," from which all our elevations of lands are computed.

The collection of current data is a much more tedious undertaking, for currents vary in strength and direction from hour to hour, not only along the axis of the tidal set, but transversely. The current is usually strongest in mid-channel and weaker toward the shores, and far inshore there may be reverse currents of varying strengths. Nor does it follow that when currents change it is a right-about-face. In some harbors and off some coasts the tidal currents do not reverse, but indulge in a rotary motion, swinging through various quarters of the compass. It is also desirable that the periods of slack waters be known accurately, for it is only at the slack that the largest liners can be docked safely, and slack water is most suitable for other operations such as diving, the sinking of pier caissons, and other underwater work.

Thus, tidal waves may be troublesome at times, but they cannot be called calamities. We have them to thank for much of our shellfish, and in places for other things. The ancient and odorous city of Chefoo is bisected by a deep gully into which the coolies of the town heave its refuse—and what the thrifty Chinese cannot find use for generally stinks to high heaven. But twice a day the comparatively clean waters of the Yellow Sea swirl in and flush the carrion and filth out to sea, much to the relief of the European nose. No, tides are not to be deplored; they are more useful than we think.

THE END.

Fifty Million Monkeys

by Raymond F. Jones

Trial and error is the slow way—but the one absolutely certain way to successful research. But if trial and error—blind chance—could be speeded up—

Illustrated by Orban

The thousand-foot cube stood out against the skyline of the industrial city like a giant with shoulders hunched against the sky.

In the morning mist the fifty-foot letters that were dwarfed upon the great walls read dimly across the city:

JAMIESON & SON

Consulting Physicists

To each one of the city's inhabitants it was the first thing to be seen each morning as they awoke to the sun's rising from behind the mountain of the building—and the last thing at night. They knew it as the "House of Tools."

Some sensational copy writer had thought up the name some years ago, when Jamieson & Son still needed copy writers to help bring in business. And the name had stuck.

Craig Jamieson had liked the name, though his father snorted in disgust at its lack of semantic accuracy. It *was* a house of tools to Craig—the mightiest tools the Universe had ever known.

Spiraling down from the unmisted stratosphere toward a roof landing on the building, he admitted a sense of pride. It had been a mere fourteen years since Jamieson & Son consisted of himself and his father grubbing away in a gloomy, now-forgotten corner of the city.

They had risen from that in so short a time. It had been easy once the secret had been found—the secret of those tools.

Their power had worried rulers of the world and legislators had tried to bind and restrict their use to the limited horizons of the lawmakers' own narrow minds. But those tools could not be chained.

They were human brains.

Craig hurried down from the roof and along one of the endless honeycombing passageways that burrowed through the great block.

He was early by an hour, but Carlotta was waiting for him in his office, idly setting up cerebral integrals on the desk calculator.

"I'm going to sleep here some night and see how early you *do* come to work," he said.

She smiled, never taking her eyes from the keyboard which she played upon intently for a minute or two. In a crisp green outfit she looked like anything but what she was, the Director of the Psychological Engineering Section of Jamieson & Son.

Craig looked quickly about the room, glanced in the mail spool hopper and turned back to the door.

"Make yourself at home," he said to Carlotta. "I'll see you later in the day. I've got to sit in with three teams before noon today."

"I know." Carlotta nodded her head and looked up at him for the first time. "I notified them all to use your substitutes, that you wouldn't be there today."

"You what! Why—" He reddened up to the ears and turned back, his fists resting on top of the desk across from her.

"Look, lady. You don't have to tell me again that you're the best psychological engineer ever bred this side of Jupiter and you do have as much say in running this business as dad or I do, but when you start running my own office it's time to take steps. I haven't sat in with a team for over six weeks. I'm getting stale. Look at my last math check. I almost flunked out!"

His eyes were smiling at her over the seriousness of his lips, but when she looked up at him again, his smile died.

"If that's all, Craig, sit down. This is serious. It's something for you to handle—out of my hands."

He gazed at the calm blue eyes beneath the ever so slightly displaced wave of gold strands. She always suggested to him the calm, slim beauty and quiet, suppressed power of a luxury liner slipping through space.

And when she said a thing was serious she had better be listened to.

He sat at the desk. "What is it?"

"Team Thirty-four. They're cracking. They show aberrations beyond the limits."

"Team Thirty-four?" He frowned. "They did that little problem for Maitland Lines last, didn't they? Turned in their report two weeks ago. Which ones are cracking?"

"All six of them."

"All *six!*" Craig stared. He knew Team Thirty-four well. Six of the finest minds in the company. Their congeniality index was well up in the nineties. Their solution average on their assignments was in the top ten of the eighty teams working in the building.

"What are they working on now?"

"Nothing. About a week after they closed up the Maitland problem they asked for a special hypno treatment. They were normal again for two or three days, then an emotional reaction began to reappear. Hal Epps forgot one night he had proimsed to take his wife out. George French neglected a special family anniversary. He and Gene Williams had an argument during a check meeting only yesterday. All of them show physiological manifestations. You'd better take it over or you'll lose an entire team."

Craig frowned and pursed his lips. He pressed a hand against the broad expanse of forehead that was bounded by a somewhat uncertain and prematurely receding hairline.

"Have you opened their hypno recordings?"

"You know that I haven't. The confidence of those treatments is subject only to you and your father, but I suggest that these be opened."

Craig nodded in assent to a decision that had not been necessary in four years. Carlotta spoke briefly into her wristphone and ordered the records of the affected men. Craig glanced at the integral she had been setting on his calculator.

"What's this?" he said when she had finished phoning.

"Just trying to associate some of the factors that might have caused the breakdown. As near as I can tell they are all carrying the burden of some knowledge which is causing a tremendous fear to dominate them and which they wish to be rid of."

"Why haven't they told me?"

"Obviously because they thought you shouldn't know it, either. Apparently they tried to dispose of it through the hypno treatment, but they didn't get rid of the emotional reaction it had caused."

"But where could they get such disturbing knowledge? What could it be?"

"They didn't exhibit any aberrations

before the Maitland problem. They did afterward. Add it up."

"But that was just a routine check on some precision instrument work! The details—" He pressed a selection of keys on a small board at the side of the desk and an illuminated screen showed him a summary of the problem and its results.

"Some errors in instrumental calculation and measurements. The team knocked it off in three hours and a half and sent a satisfactory solution to Maitland. I think you're off the beam there."

"I'll admit I'm only theorizing—but here come the spools."

A minute button on the desk flashed that the pneumatic spool delivery tube contained confidential material and could be opened only by applying the proper combination. Craig opened it after a moment's concentration on the lock, and took out the six spools. He crossed to the other side of the office and broke the seal upon them. There, he fitted them into a small projector. He took out the two headsets and handed one to Carlotta. She accepted matter-of-factly, but looked with hesitation as Craig began fitting the tight, elastic cap to his own head.

"I can take this stuff, you know," she said, "but are you sure you ought to—at least until I have had a try at it?"

Craig snorted volubly and clamped the cap to his head in a jerk of unneeded force. He turned the machine on.

The first wave of near-paralyzing fear threw a giddy, shimmering cloak about him. He groped blindly amid darkness for a chair. Carlotta helped him to one.

Surging, mounting—that fear filled the Universe and had nothing to do with personal security. It was fear that existence itself would cease to be existence and become a black and nameless nothingness.

He tore off the headset and sat in momentary trembling. Impassively, Carlotta stood beside him. Her eyes were closed, but the cap was still on her head. No expression showed on her face as she let that terrible sensation flow over her mind and rebuffed it calmly.

In wonderment, Craig watched her. He knew that such ability was the result of her long years of training in peering into the dark, mysterious, amplified depths of men's mind. Yet still he wondered how she could do it day after day and remain sane. He glanced down at the headset in his hands and let her go on.

After a moment, she opened her eyes.

"Here's the part you should know. I'll turn it down a bit."

He refitted the cap to his skull once more and the subdued impulses throbbed in his mind again. He sensed something more definite than the blinding fear. He sensed a conflict. And he sensed the cause of it. There was the impression of a vast, overwhelming curtain that hung threateningly over all creation, like a wrap of night about to fall forever.

Then it was over. The spools had run to the end.

He wiped his brow. "They must have sent up the wrong spools. That could only come out of a psychopathic ward."

"We have the right spools. That came out of the minds of Team Thirty-four," said Carlotta. She replaced the headsets and closed the instrument. "Apparently in the hypno treatment they consciously tried to get rid of the overpowering emotion without letting go the cause of it. The only tangible thing there is that falling curtain of blackness. I can't make anything of that, can you?"

"No. It doesn't make sense. It's a nightmare. No wonder those poor devils can't work with such stuff stirring around in the bottom of their brains. What do you suggest?"

For a moment she didn't answer. He looked up sharply and saw a momentary shudder pass through her frame.

"Carlotta! What is it?"

"Nothing, Craig—I'm just an old woman, I guess. But this was a bit stronger than anything I've experienced for a long time."

"You shouldn't do it."

"I looked up a few of the indexes on the team before I came in. Their stability is right up near the top. It means that something has driven them to the brink of insanity to produce such stuff as we experienced. We've got to find out what it is. I can tell you this much: The Maitland problem was no mere instrumental deviation problem. It contains a horror that can unbalance the stablest brains in Jamieson & Son."

"How are we going to find what the cause of it is?"

"Could any of the teams you sit with have handled the Maitland problem?"

"Sixty-eight could carry it off."

"Give it to them. Find out what you can of it. Let me listen in, and, if it begins to get you the same way as Team Thirty-four, I'll throw out an audio block. In the meantime I'll go over the basic spools of Team Thirty-four and see if I can find some definite approach to them."

Craig Jamieson watched her slender, green-clad form go out the door. He sat motionless turning over in his mind the problem of Team Thirty-four.

The idea of brain teams was fifteen years old now. When Harmon Jamieson, Craig's father, was a young man, science and technology were in a hopeless boggle. Centuries of incessant piling up of knowledge and techniques had reached the point of diminishing returns. Each year it became increasingly more difficult for a student to catch up with what had gone on before him and place himself on the frontier of knowledge where he might contribute something original of his own.

As far back as the dim, distant twentieth and twenty-first centuries the problem had been recognized and challenged—but not solved—by "specialization." To be of any worth in that day a man had to become a "specialist." He had to narrow his field of investigation to microscopic proportions until he could announce himself as master of an infinitesimal portion of the Universe.

To speak in that long-ago of a man as merely a chemist or a physicist or a mathematician implied that he was no more than a jack-of-all-trades. It had to be explicitly stated on what obscure little group of compounds he had become an authority, or with what fraction of the electromagnetic spectrum he was familiar, or what brand of equations.

In the decades and centuries that followed, this trend became acute. Specialists rattled about like ill-fitting buildings blocks with no common facets. Papers and formulas and principles flowed in a torrential stream from their laboratories and pens.

But science itself was bogging down. The flood of materials could not be correlated; it could not be utilized. Only a handful of men in all the world were familiar with any given fraction of it.

Educators recognized the problem, but the specialists refused to be dictated to by the ignorant and unlearned whose only function was the background training of new students. So students, in order to achieve any place in the world of research, narrowed their work still more in pursuit of their vicious, inspiraling circle, and ignored all the vast mass of knowledge that did not pertain to themselves.

But in the twentieth century the problem had been only elemental. A mechanical designer and a metallurgist could build a motor. Each could absorb a sizable block of the other's science and co-operatively produce a simple machine.

Eight hundred years later the problem was forbidding. The Stillson motors at the heart of the beam-power transmission system that crossed space and fed the space liners were the end product of ten thousand brains that spent their entire existence in minute specialization.

There was not a single brain that had ever existed that fully comprehended every principle and every engineering application involved in the Stillson motor. It was not inconceivable that it could be done; it just hadn't been. It was estimated that a brain with a Goldsmith Intelligence Quotient of a hundred and sixty could accomplish the feat in about forty-three years of intense application. No one had ever tackled the job.

The Stillson motor was, admittedly, the extreme case in practical engineering application, but it was an example of where science had gone.

The problem resolved itself into the necessity of unifying in one mind the knowlege that it would take a dozen or more lifetimes to acquire. It is hard to say what might have been the end result to the world of industry and science if the Jamiesons and Carlotta had not discovered the principles of the science of brain teaming. At least the Stillson motor would never have become a practical reality.

Craig Jamieson's student life was made wretched by his impatience with the slow, plodding reluctance of his own brain to learn and hold facts and principles that would make him the scientist he desired to be.

The opening day of his sixth year of the ten-year student program to which he was committed he met Carlotta on the campus of International Polytech. After an hour he was snorting out his disgust and impatience to her.

Students from all over the world were swarming over the grounds. "Look at 'em," he observed from the point under a shading tree where he and Carlotta sat on the grass. "Bringing their little bucket heads here to be crammed full and they can't get back to where they came from without three fourths of it spilling out and most of the rest leaking through the bottom. It's all wrong, I tell you. The human brain wasn't meant for such functioning. Take math, for example. Why do ninety-nine percent of the people boggle along through their lives, fumbling with figures and equations that they hate and never learn how to handle, and yet can't get along without?"

Carlotta shook her head. "I don't know. Why do they?"

"It's because the human brain wasn't made to function along mathematical lines. The human brain is not an instrument of precision and reasoning. To make it function as one is being like the ancient aborigines who used to tie up their skulls with boards to make them grow pear-shaped."

"Well, what *is* the human brain good for? I'm in psych myself. Maybe I should pause while you revise the science."

He knew she was making fun of him, but he lay back lazily on the grass and looked up through the green pattern of the leaves at the blue and white above. There was only a wisp of cloud in the sky and it was right above them.

"Look, lady," he said suddenly. "See that up there?"

She reclined and followed his gaze. "What?"

"How would you like to be up there on that cloud just floating along with a sandwich and a cool drink in your hands, music in the air and not a thing to do until the day after next year—instead of having to go to a grubbing old class in about ten minutes and put a hypno cap on your head so they can fill your bucket brain a little fuller?"

"Sounds nice," she murmured.

"That's what I mean. That's what the human brain is good for: dreaming—fantasy. Not grubbing away with clumsy devices like mathematical concepts and machinery."

"That's strange talk from a man who has covered half the ground on the way to becoming a research physicist."

"Look, lady—for a psychologist you don't follow very well. It's *because* I like to use my brain for the one thing it's good for that I have to grub around with all this secondary stuff of science and mathematics.

"If I wanted to make my fantasy of floating on a cloud come true, I could—but look at what a lot of unpleasant stuff I'd have to plow through! Look at the

math . . . ugh! . . . that it would take to devise a gas vortex that would hang together up there and be capable of supporting me. I'd have to figure out how to keep the ionization potential from blanketing out the radio music I want. When I got through I'd be so tired out I wouldn't even enjoy sleeping there, anyway."

"You're just plain lazy," Carlotta decided.

But Carlotta changed her mind when she found out a little more about Craig Jamieson. She found he had a G. I. Q. of one hundred fifty-eight and a Brinker Rating of eighty-six which put him ninth from the top in a class of three thousand students representing the cream of the young brains of the world.

And as the year wore on their association became closer and she caught faint glimpses of the thing he wanted—the thing that tormented him so.

When she first caught an insight, she chided him. "There's nothing wrong with you except that you've got a superman complex, Craig. You want to see the whole Universe inside and out. You want to go *everywhere*. You want to know *everything*. You can't endure the thought that there should be some knowledge you do not know, some skill you cannot possess."

He looked into her solemn, penetrating eyes with laughter lurking far away in the depths of them. He felt that his brain was naked before her gaze. No one else had ever remotely suspected the torment that flowed through him. Only his professors during his first year had seen his first frenzied attempts to grasp everything that came within range of his intellect and warned him to restrain himself or fail by overreaching his capacity.

"You've got my number," he said. "I guess I should have known better than to pick up with a budding psychologist."

"It doesn't take a psychologist to figure that out. It's written all over you: Frustration—in letters a foot high.

You'd better do something about it or it'll get you."

"What is there to do? I guess it's just a screwy twist in my cortex. Maybe I ought to see a doc and have it ironed out. You just don't know what it's like—"

He leaned back where they were sitting and looked up at the stars burning in the night sky above them, pouring out that poignant, indefinable yearning upon him.

"Nonsense. It's a problem—solve it."

"Maybe there's no solution."

"There always is. There are no insoluble problems. There are only human limitations."

"Now we're right back where we started."

He lopped off two years of the projected ten and graduated in the second shortest time in the history of Polytech. The rigid confines of his training were unbearable and he knew he had to get out as soon as possible.

He went into his father's business immediately, the little one-horse consulting physics office that his father had run for over forty years.

Business had dwindled to almost nothing. Any firm large enough to have problems demanding the services of a physicist had a research staff of its own.

The firm of Jamieson & Son was on its last legs when Craig came in.

About this time the Maitland Lines began their first experiments with the crude Stillson motor that had been knocked together by a group of Maitland's engineers. The thing functioned, but that was about all that could be said for it.

Craig remembered the day when he and Harmon Jamieson talked about it over an electron microscope.

"They'll never make it work," Craig said. "The thing is as complicated as a plate of hash."

"They'll iron out the bugs. That motor is a great achievement," Harmon Jamieson said. He straightened with a painful grimace at the clutching arthritis that twisted his joints. His voice was thin and piping in the glistening hardness of the laboratory.

"Sure it's a great achievement," Craig replied, "but they've gone as far as they can."

"Why?"

"You can't stuff enough into a brain in less than a lifetime to even understand how the thing works. A Stillson engineer would have long whiskers down to here before he could even do simple maintenance on the thing. You need the power of seventeen brains stuffed into one."

"Well—maybe they'll do even that, some day. The hypno process is being improved constantly. What you know would have taken thirty years to acquire by the old classroom methods used up to three or four generations ago."

"That's no consolation. There's a limit to the functioning of the human brain and I think we've just about reached it, now. There's nowhere to go from here, unless more brain power can be tapped from our skulls.

"Still—look, dad—what if we could find a way to make the Stillson motor practical, make it possible for engineering and maintenance to be done on it? That would sure take us out of the red."

"I don't see what you're talking about. The motor is practical now, isn't it? It's working."

"But not well enough. It's dangerous in many respects. If changes are made, there is no way of telling whether they are for better or worse. The whole thing was put together by blind chance. It's a miracle that it works at all. Even the engineers who made the final assembly admit they don't quite know what makes the thing go."

"Then what do you propose to do?"

He looked thoughtfully at his father. "Maybe tuck seventeen brains into one skull," he said.

In that sentence lurked the germ of the famed brain teaming concept.

The human brain is a small unit by itself, Craig reasoned, and when the capacity of the unit is reached, why can't it be teamed with other units to accomplish a given task beyond the power of any single unit.

Again, a group of highly specialized brains are little more than a group of highly specialized machine parts. And a single machine part by itself is functionless until combined with other parts to make a whole machine.

Co-operation between scientists was nothing new. But it was more a word than an actual fact. To be sure, scientists met and held conferences and worked side by side and talked things over and complimented each other's papers.

But actual working together had never been done in the scientific world in the same sense that two laborers work together when they each pick up one end of a heavy box and carry it off. It could hardly be said that two scientists, each of first-caliber brains, had ever picked up both ends of a heavy problem simultaneously and in perfect synchronization and carried the thing off.

This thought was in itself black blasphemy, Craig knew. Out of some perverse streak, scientists had always prided themselves first on their international and then on their interplanetary co-operations. Craig knew this was mostly poppycock. Scientists were essentially individualists. They were not prone to adopt superior methods not of their own devising. Large barriers separated vast fields of knowledge where free traffic should have prevailed because men of one science did not and could not know what men of another had done.

In his first dim groping Craig pictured to himself a group of men, a half dozen chemists, as many radiation engineers, three or four metallurgists and a sprinkling of mathematicians along with necessary designers and production experts sitting down over some problem, say the Stillson motor. He imagined them capable of understanding the broad phases of the problem individually and the general inclinations of each other's minds, and being able to apply their own individual knowledge at exactly the right time and place like a group of musicians playing a symphony.

When Carlotta came to visit him during the Christmas vacation of her ninth year at Polytech, he tried to tell her what was in his mind.

He told it uncertainly. "I don't know if you get the idea or not. Think of an orchestra. You have as many as two hundred people performing exactly synchronous acts in achieving one single goal. Try to imagine two hundred scientists doing the same thing. You'd hear nothing but the crashing of glassware."

"Craig!" Her eyes were alight with a flame. "You've got it! That's the same thing you've been looking for all these years!"

"You see what I'm trying to say?"

"I think I do, but your problem isn't one of physical science. It's a psychological one. So frequently foremost researchers are tremendous egoists, though they appear to be so self-effacing on the surface. The truth is that they often enjoy a degree of self-pity in this effacing pose and at the same time identify their own egos with the work they do, sharing any praise or success that comes to it. They actually have a very neat and deceptive way of getting an abnormal satisfaction both coming and going.

"It is this quality that so often prevents co-operation between highly competent intellects. The first requirement of brain teaming would be to eliminate all such qualities. Then you would want men, each an expert in his own field, who think and breathe and act alike. A sort of congeniality index could be devised—something of the sort has already been explored. The traditional idea of powerful, objective minds working side by side though the individuals are mutually loathsome to each other is a lot of rot. By selecting the proper congeniality index you could team men whose relationship to each other would become closer than family ties."

That was the way it often was with Carlotta. Craig proposed a concept and her mind leaped far and away from his, burrowing into the details of which he had not even a glimmer as yet.

Together, they devised tests and, from among their associates at Polytech, they built the first brain team of Jamieson & Son.

That team, on which Craig himself took a place, was the first Stillson motor team. It made history—and took Jamieson & Son out of the red. The giant, unwieldy, complex creation was refined and stabilized until its performance was reliable enough to warrant the removal of the self-contained propulsion methods on spaceships and leave them powered by beam transmission alone.

To Craig and the other men who sat with him on that first team it was a weird and incredible experience. Responding to tests devised by Carlotta and Craig, twenty-five total strangers from all parts of the world were brought together and found themselves suddenly feeling alike, thinking alike—almost capable of anticipating each other's thoughts.

In ordinary course of events few of these men would ever have known each other. They would have pursued their own narrow interests with varying degrees of success. Brought together by the powerful, unifying principles of brain teaming, they suddenly became a mighty tool of research capable of peering into depths far beyond the capacity of any brain or conglomerate group of brains previously.

Yet, that first team had been crude and imperfect beside the ones now filling the great block that housed Jamieson & Son. There had been imperfections, little traits that Carlotta's tests were too crude to detect at that time. The team dissolved after three years of work.

By that time, however, Carlotta had reached a state of perfection in her work that a definite science of brain teaming could be said to exist. It was an exact science that followed easily discernible laws. It went beyond Craig's most fantastic expectations.

Eighty teams formed Jamieson & Son now. The world was scoured clean for potential members. The highest ambition of science students the world over was now a place on a Jamieson brain team. The smallest team was two men, the largest—the present Stillson motor team—was sixty-three men.

Each unit occupied its own laboratories and libraries and had use of the common shops and mechanical facilities of the company. Hundreds of assistants who had applied for team membership, but failed to meet the exacting demands, formed a corp of workers who did the more routine work involved.

Each member of a team had spent ten to twenty years of his life acquiring the intricate and specialized knowledge that he held in his brain. Powered by the psychological selection and conditioning devised by Carlotta these multiple brains of a single team acted almost as a single brain.

The eighty teams were the mightiest research tools the world had ever known. Hundreds of large plants had abandoned their own research laboratories and relied entirely upon Jamieson & Son.

It was not to be wondered that there were those who looked with fear and trembling upon the firm of Jamieson & Son when they understood the power that lay behind those great blank walls.

Craig let his mind wander in relaxed concentration over these events as he pondered Team Thirty-four and the disruption that threatened it.

His office door opened abruptly. He looked up with a start and the six members of Team Thirty-four walked in. They looked as if they had been up all night and had tried to snatch some early-morning sleep in their clothes.

"Hi, chief," Hal Epps, team spokesman, was in the lead. He gave a tired wave of his hand.

"Sit down, fellows," Craig invited. He looked at them quietly, masking the surprise at the unexpected visit.

Hal Epps looked at Craig. He hesitated, his narrow ascetic nostrils twitching slightly. "Without a lot of speechmaking, chief," he said at last, "we want to be disbanded and try to do a little independent work for a while."

"You what—" Craig half rose out of his chair.

"That's right. We're through as a team. We can't work together. Our congeniality index is down around zero. I don't know what hit us, but we just can't go on. We want to be disbanded."

So it was as serious as that.

Or perhaps it was that good. He had seen teams lose their congeniality index and disrupt. But none had ever asked for voluntary disbandment. That meant they recognized their own problem and it was not a problem based on lack of harmony.

"Why?" said Craig quietly.

"We just do, that's all!" Hal Epps snapped. The others nodded and barrellike George French added, "We think it would be best for the company and for ourselves."

Craig fumbled an ornamental gadget on the desk top and looked at their drawn, tense faces. "I don't have to tell you this is the first time a team ever asked for voluntary disbandment. And I don't think I've ever seen a team become so overwhelmed by a problem before that they were afraid of their own shadows."

At once, almost visibly, the six of them seemed to melt together in a single unit. He sensed the sympathetic thoughts flowing in unison through the six brains. That was the damnable part of these teams, he thought: you couldn't attack them one by one. It was six against one.

"We didn't come to argue, chief," said Ralph Davis. His bony jaw was knotted hard and his lips were thin. "We came to state our intention. We have done that. Thanks for listening, chief."

They rose to go. Craig felt a flurry of defeat. If they left now, it would be too late to salvage the team, even though he later found the cause of six sane men suddenly becoming possessed of an unreasoning terror. It was of gigantic importance for him to know now.

"There's just one thing," he said, "what will happen when that curtain of blackness falls?"

They turned as one man, faces blanched. "You *know*—" Hal Epps gasped.

"Of course not," Davis snapped. "He opened our hypno spools. I told you we were fools to try that. Come on!"

"It was the Maitland problem, wasn't it?" Craig said relentlessly. "It's out in space somewhere—you don't know what it is—or where it is—but you're afraid of it."

Pete Ellison, who had remained in the background and said nothing up to now, sagged in resignation. "He's got it."

Hal Epps recovered from his first consternation and shot him a look of fire. "Nonsense. We know you're shooting in the dark, Craig. It won't do any good. We're leaving Jamieson & Son for good. We've got our own reasons. They don't concern the company, and . . . well, I guess that's all. You've been swell, chief. Sorry we have to be so abrupt about this."

But Craig knew he had driven a wedge between them. Pete Ellison *wanted* to tell. He drove on.

"Whatever it is, whatever that black falling curtain in your minds means, I'll find out. Do you think you are the only Team Thirty-four that can be created? I can build another one in a week. I'll get the Maitland problem back in here and throw it to all the teams. They'll find what you found sooner or later. So give—and save us all that trouble."

They wavered and as one man returned to their seats.

"There are six of us," Hal Epps said. "In this one matter, we are still a team. We know that the best answer is to allow us to disband and forget about the whole thing. That is a more accurate solution than your one mind can possibly obtain, even if you had all the facts—which you haven't."

"You are no longer fully sane men. You are filled with fear that nullifies any claim to reason in the matter. You are not capable as individuals or as a team of acting as a positive function in the matter. Tell me."

Epps' face reflected a tortured pleading, but he began to speak slowly. "The Maitland problem was an instrumental one on the face of it. A score of times in the past six months Maitland Liners had found themselves as much as a light year off course on a long flight, with absolutely no explanation for the deviation. Their own mechanics worked over the energy meters and course computers until they had nearly worn them out. New equipment was installed, but the same deviation was discovered on the brand-new ship, *Queensland,* when she was commissioned. Our problem was to find the answer to these deviations."

Craig glanced at the data sheet he had caused to reappear on the small screen on his desk. "And it took you three hours and a half to satisfy them."

Hal Epps ignored the implied compliment. His thin, worried face was unnaturally drawn and pale. Craig could not conceive the magnitude of the problem that could so affect the normally suave, dry-humored Epps.

He went on. "We did not solve the problem. There is no solution to the Maitland problem. We only showed them a method of introducing compensations into their instruments which will make automatic allowances for the deviations. The problem still remains."

"And the problem is—?"

Hal Epps looked at his companions. They were sitting tight-lipped and impassive. As if by prearrangement, George French took over. His deep, reverberating voice and precise planting of words seemed to chill even Craig with unnamable implications.

"You have not kept up with the developments on the Stillson motor and no doubt you do not understand the processes of beam transmission now involved," George French said. "You know the term 'spatial polarization,' which is the only mathematical term that will mean anything to you since your math does not go far enough.

"This 'spatial polarization' is somewhat analogous to charging the plates of a condenser. Space, viewed from the transmitting end, becomes one plate. Space, viewed from the receiving end, becomes the other plate. Unlike the first crude attempts at beam transmission, no energy is dissipated until a receiver is functioning somewhere in space—or so the theory would indicate in spite of the fact that the actual Stillsons pour out billions of kilowatts per second more than the receivers account for. Since space as a unit forms the active conductor there is—or should be—no attenuation with distance."

"I am vaguely aware of that," said Craig dryly. "I was on a Stillson team once, you know."

George French ignored the touch of sarcasm and went on patiently and precisely. "The flaw in the entire concept is that the assumption has always been made that space is homogeneous. In all the history of science there has been no tenable reason for thinking otherwise. The laws of chance show that during the probable existence of Earth, man would never encounter any other condition. Would not, that is, had it not been for the Stillson motor and the system of beam transmission of power for liners."

"What's that got to do with it?"

"The spatial polarization represents a condition of strain in space which inevitably tends to nullify itself. Just as electrical charges tend to leak off when not insulated, so the spatial polarization tends to discharge itself. Since it represents an entirely uninsulated condition, there is nothing to impede that leakage, hence the tremendous outflow of energy which has baffled Stillson engineers for fifteen years.

"The result of this is that there is a force present in our space that tends to draw toward it, so to speak, another space which represents a condition of opposite polarization. When the two conditions of our nonhomogeneous space completely merge they will cancel out like opposite electric charges brought together. Space, as we know it, will cease to exist."

For a long time Craig Jamieson sat motionless, staring at the six strained faces before him. In spite of their reluctance to tell, it seemed as if a wave of relief swept over them as George French finished.

But only dimly did the words register in Craig's mind. The mathematical concepts for which the words of George French were crude substitutes were far beyond his mathematical knowledge.

But the words echoed and re-echoed in his mind—the nullification of the spatial polarization set up by the Stillsons—the merging of two nonhomogeneous parts of space. The concept flashed a bewildering facets before his mind in exquisite torment, but the whole was inconceivable.

And then cold black fear raced through his brain. It burrowed into the wells of thought and flowed through his being in one wave of unrestrained terror. He knew then without donning the headcap of the hypno translator the fear that filled these men, knew the meaning of that falling black curtain—the black curtain that would be *final.*

"What will happen to us . . . to man? What will happen to the Universe?"

George French looked steadily at him. "We will never know—exactly—because we will all cease to exist at precisely the same instant. *Everything* will cease to exist.

"You cannot, of course, conceive of that any more than you can visualize your own death, but that represents our best analysis of what the result will be. You could verify it with the help of the three-man team on Ingrid's equation which postulates the nonhomogeneity of space, but I doubt you would learn any more. And it is unwise that any more should know of this condition."

Suddenly the stark fear and strain on the faces of Team Thirty-four became grotesquely ludicrous. Craig restrained an impulse to laugh. They had been so terrified by the implications of the potential disaster that they had overlooked the one simple solution to the whole thing.

"Obviously, the only thing to do," he said, "is to destroy the Stillsons. Space flight will have to return to self-powered units until we can devise some other method of propulsion. I don't see why you—"

But the faces before him did not relax. They continued to look at him with a degree of patronization and sympathy that congealed the fear within him again.

George French broke the silence that followed Craig's trailed off words. "Think a minute, chief. Apart from the impossibility of ever convincing mankind and the officials of Maitland that the Stillsons should be turned off, you must recognize that it would be useless to do so.

"The transformation of space has already begun. Fifteen years of operating the Stillsons have created a condition in space that is inconceivable. The charge is flowing out at a tremendous rate. Figures aren't big enough to name it. The inflow of oppositely polarized space is accelerating constantly. Nothing can stop it. That's why you and we would be best at the bottom of the nearest lake right now. Our minds won't stand up under that knowledge. Ask Carlotta. Only she'd better join us if you do. The rest of mankind need never know—*must* never know. That's why you should not have made us tell you why you must not throw the Maitland problem open again.

"The extinction will be painless and unperceptible when it comes."

Sweat beaded Craig's forehead. The office was stifling hot and the walls seemed to be crushing inward like an unyielding black shroud. He shook himself and focused on the six faces of the team.

He knew they were not wrong. He knew the power of those combined brains. He had created the combination and knew the strength of his work. But why had they given up all hope?

"I have no doubt of what you say if you are in accord in your analysis that the process of leakage is already underway. But from there on you go completely off the beam. Why should you say that it means the extinction of existence? Why can't the process be halted? Why can't the strain between the nonhomogeneous factors be equalized in some way?"

"It's easy to ask that, chief," said Hal Epps, "because you don't understand what it's all about. You have only our brief and inaccurate word picture. Your brain is incapable of holding a true mathematical beam analysis picture. If it were, you would see the obvious answers to that. Believe me, we've *tried*—and there is no solution."

Craig knew they were right. Knew his sudden wave of enthusiastic aggression against this thing was born of ignorance. If any men in the world could conquer the creeping oblivion, they were the six who sat before him, and they had pronounced it an impossibility.

They rose to go. "Will you join us at the lakeside at midnight?" Hal Epps said. His thin face held wry and bitter humor.

When they had gone, he remained immobile in the same position. He was there when Carlotta came in moments later.

He did not notice her or ask her to sit down. His eyes were staring ahead at the wall.

"It isn't possible," he murmured. "Outside, the sun is shining. Ships are taking off for Mars and Canis Major. People are eating and sleeping and working like they've been doing for ten thousand years. Jamieson & Son are working on the usual mechanical and radiation problems to keep the wheels turning—and then in comes Team Thirty-four, walking about like some white-gowned prophets of ages back, crying 'Woe!' "

"Easy does it, chief." Carlotta's eyes were steady on him from across the desk now.

He looked at her. "You heard?"

She nodded.

He rose and began striding about the room. "Inside these walls is the greatest machine for research the Universe has ever known. We've multiplied the abilities of any of these men by hundreds of times. The solution must be here somewhere—it's got to be.

"I can't conceive why Team Thirty-four wants to abandon the problem as hopeless. Even though their equations tell them it is insoluble now, there are new principles, new possibilities that man has not even glimpsed. Why must they say there is no solution? They know that no negative proof is ever demonstrable. It is always a theory."

"What do you propose to do?" asked Carlotta. "Do you think there is a way out?"

"Are they right in their insistence that the world never know of this?"

Carlotta nodded. "I could work out the picture in good detail showing the results if this were broadcast. It wouldn't be a pretty picture. Extinction might not even wait upon the collapse of space."

"I suppose you're right. We'll throw it to all the teams, then. We'll cancel immediately every obligation we have and turn the full force of the eighty brain teams on this problem. If they can't find a solution—"

"You can't do that, Craig." Carlotta shook her head slowly.

"Can't— What are you talking about? We've *got* to. It's the only thing left to do."

"Do you want all your teams in the same condition as Team Thirty-four?"

He whirled upon her and then sat down slowly behind the desk, shaken to the core by this thought that had not entered his brain before.

"How many teams could hold up under it?"

"No *team* could."

"What do you mean?"

"You would find only isolated individuals here and there who are capable of bearing such knowledge and working under it."

Craig made an instant decision. "Find me those individuals then. I'll build a new team—an emergency team. I want you to ransack every established team we have for brains that can cope with this. I'll merge them into Team Thirty-four and then we'll see if this is a hopeless problem."

"You won't find many," Carlotta warned. "None of these men were originally chosen to face such a crisis. They are no more capable of it than any other thousand men you might go out and pick up on the street."

Her eyes became intently serious and locked with his in a mingling of emotions that left him half confused, half yearning— "It's yours, Craig. It's your problem. I think of all the men in this big blind cube of yours, you will have to take the problem."

"But I've got to have help!" he exploded. "Hell, any one of them can run circles around me in his own field. I only *run* this place!"

"See that you continue to run it. Let them know that you are taking over full responsibility for the solution of the problem. Let them know that its solution is certain, that it's a matter of time if they all give you what you ask for."

"They aren't dumb and blind—I can't kid them with any sugar coating like that."

"They are human beings. This is something none of them were born to face. None of them can face it fully and do his best work. Let them unload that responsibility on you. They will do it unconsciously if properly directed. It is essential."

The fundamental premise on which the functioning of the teams was based was the principle of congeniality—friendship.

The greatest industrial mistake that had been perpetrated through the centuries, Craig had found, was the throwing together of uncongenial individuals and expecting them to work together with efficiency.

Under his direction, Carlotta and her staff had reduced the principles of congeniality to an exact branch of psychological science. On this foundation the teams were built up. Their unity through the years of working together developed until the emotional bonds between them was greater than that in ninety-five percent of family relationships.

Now, for the first time, Craig found himself faced with the necessity of violating that cardinal rule of Jamieson & Son.

But he could see no other way out. He had to have a team emotionally capable of facing the problem of the disaster brought about by the Stillson motors. There was no time to build a properly functioning team. Actually, this emergency team would not even be a team. But all he could do was throw together conglomerate units torn from the teams he already possessed.

Team Thirty-four, of course, would form the backbone of that emergency team. But they were not enough. They had pronounced the problem insoluble and their individual stability was gone. He had to have the faith and hope of other men and other knowledge. The building would have to be ransacked for every brain that could contribute a particle.

For himself?

He allowed his brain a momentary pondering of his own position. It was a shattering, devastating picture. He stood at the pivotal center of the program that would determine the fate of the Earth.

It was impossible. *His* brain had been built for no such feat. Why had Carlotta so blandly assumed that he could endure the disintegrating knowledge? She had warned him to not tell even his father.

Craig knew he was no different from any other man out in the street when faced with knowledge of certain destruction. But that was not it—it was not his own destruction merely; most men are equipped with mental mechanism to face that. It was the destruction of all existence—and no man is equipped with the mental mechanism to face *that.* It was barely conceivable. And the more he tried to focus his powers of conception on it, the more his brain swam in a maelstrom of irrationalism like a myopic eye, straining and staring at a dimly lit page in an unknown language.

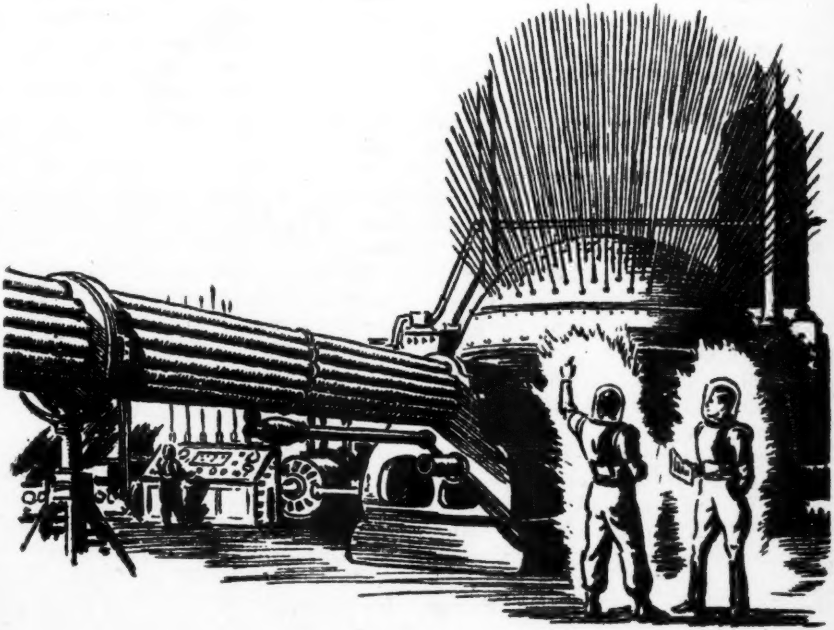
He flung it out of his brain and left the building.

Abel Maitland was waiting for him at his office next morning.

The beefy, florid president and controlling stockholder of the Maitland Lines greeted him with an extended ham of a fist when he entered from his hurried walk down the long corridor.

"Craig! How's tricks? Been a long time since I saw you. Why don't you come around and bring the old man over for a trimming some night this week? How is the old fudger these days?"

"Arthritis is still bad," Craig murmured. He wondered what Maitland wanted. Craig was anxious to see Carlotta and have her report on the men she



had selected. "What can we do for you?" he asked.

A friendship had existed between the Jamiesons and Abel Maitland since the early days of the Stillson motor. But it was a stormy and a rather intermittent friendship.

This condition was caused by the furious devotion of the two old men to their games of Chessmath. The complicated game, played with nearly three hundred pieces and requiring the use of portable triple integral calculators, was Harmon Jamieson's sole delight in his waning, pain-distorted years. And Abel Maitland held himself to be the western exponent of the game—despite the fact that Harmon Jamieson held an almost evenly matched record with him.

But at frequent intervals their old men's tempers flared hot and their friendship died on the altar of the game. In a game that bordered the frontiers of mathematical science, the rules were uncertain and sometimes ambiguous. When one accused the other of ignorance or cheating, their friendship entered a hiatus that might run for months.

It had just recently emerged from such a gap.

Maitland sat down with a grunt and extended his stubby legs in a search for comfort. "You did a little job for us a couple of weeks ago. Your boys gave us a quick solution to our problem—but it didn't stick."

"What do you mean—didn't stick?"

"Well, we redesigned our instruments in accordance with the suggestions given. They still won't work. It seems to me . . . well, this is the first time we've had any trouble with a problem handled by your company."

Craig pondered the obese president of the space lines company. He was not lulled by the casualness of Maitland's complaint. What did Maitland know? Nothing but a major catastrophe would ordinarily stir him out of his office, hardly even his friendship for Harmon Jamieson.

"It affects our radios now, too," said Maitland. "That's something we hadn't noticed until just a few days ago. Makes communication almost impossible in certain areas out around Saggitarius."

Craig couldn't spare Team Thirty-four to waste any more time with Maitland. The problem was far bigger than that. "Apparently the fellows that worked on the problem missed some important point when they received it. I'll tell you what I'll do. I'll send one of the teams along with your next ship that's headed for a troublesome area. That's about the best way I know to spot something tricky like this."

"If you think it's necessary—" Maitland wasn't at all sure that Craig was as much interested in the problem as getting him out of the office. "We've got to have an end to this, you know. I'll have to call in another agency if necessary." He raised his eyebrows questioningly.

Craig hesitated and went cold all over. Suppose someone else got hold of the problem and found out—it was barely conceivable—and spread it broadcast.

"All right, we'll open it up again, if you insist," Craig said quickly. "I'll put a couple more related teams on it for you. Give us three days. Will that do?"

Maitland nodded. "It will do—if the problem is solved in that time. The new data on the latest runs is available any time."

He rose. "And tell that old man of yours to oil up his tin brain. I'm coming over to start a game in a few days."

When Maitland was gone, George French came in at Craig's call. He looked briefly over the problem sheet that Maitland had made out.

"The fool didn't do what we told him to," said French. "He didn't build new meters along the principles we outlined. He just had the old ones revamped and we expressly told him not to do that."

"We'll have to tell him again, then. It's important. If anyone else should get hold of this before we crack it—"

George French looked long and contemplatively at him. Then he shook his head slowly.

They met an hour later in a sealed and soundproof chamber in the exact center of the great sightless cube of Jamieson & Son. Carlotta was there, and Team Thirty-four—with resignation and an air of sympathetic pampering toward a useless whim.

And the eighteen additional men that Carlotta had pronounced reasonably safe from an emotional standpoint.

In their turn, each of the six members of Team Thirty-four rose and presented the intricate knowledge he possessed of the phenomenon that was disrupting space flight and heralding universal destruction.

The eighteen new men took it expressionlessly. They were uncomfortable, Craig knew, working outside the association of their accustomed teams, but the powerful action of their minds was shaping a concept of the problem.

The solemnity that he saw creeping almost imperceptibly over their faces sent a chill of foreboding through him. Several men had brought portable calculators and were swiftly checking the reasoning of Team Thirty-four.

Matthews of the Universal Equation Team Sixteen was furiously playing upon the keys of his machine. He was the crack mathematician of the entire organization. Occasionally he looked up at the man speaking and then at Craig and Carlotta. A scowl crept through the long vertical furrows of his face and he patted the keyboard with finality.

Craig felt a restless uncertainty through it all. Partly because he only faintly understood the depths to which the members of Team Thirty-four plunged in their description of their work. Partly because he was counting with all the strength of his being upon these men. If they failed him—

George French presented the summary. With admirable restraint, he refrained from stipulating any conclusion reached by his team. He merely summed up the exact nature of the problem and sat down.

Then Craig waited for the reaction.

There was only silence and waiting, a silence whose tangible pressure could be felt. At last Craig arose. "Matthews, I'll ask for your expression."

The old mathematician rose slowly and looked about him. Like thin wattles the loose skin beneath his chin trembled as he turned about.

"I'm sure each of us here has arrived at the same conclusion regardless of the fact that we are not a team. The problem presented is incapable of solution in any finite length of time. I have worked out a little elementary proof here if you'd care to have it." He nodded down at the calculator.

"But I don't think it will be necessary," he continued. "Of course, we will go over the original data in greater detail and rework all the equations of Team Thirty-four, but I am sure they have done their work correctly. The picture is insoluble. It is a problem now for the psychological staff—and the religious ministry."

He sat down.

A white, steaming fury, utterly irrational and unreasonable poured through Craig. He felt smothered and trapped. The sober, unrelenting faces of the assembled scientists were the faces of executioners who had doomed man to an intolerable fate.

He fought down the unreason and then rose before them. "I hadn't quite expected this. Who is in disagreement with that judgment?"

He waited in stifling silence. Someone shuffled his feet. There was no further response.

"If you give up, there is no hope," Craig said slowly. "Within this block of Jamieson & Son are the most powerful tools of research in the Universe—you men and your team companions. Because I am in ignorance of the details of this problem which make it seem hopeless, I still have hope—and so I'm going to fight it. But the only tools I have are the tools I have always used—your brains and your intense knowledge. If I have to fight it alone, will you at least let me use those tools to capacity?"

Not a man but looked upon Craig Jamieson with depths of sympathy. They caught the engulfing sense of responsibility that overshadowed him, felt the urgency in his soul—and felt helpless before it.

Matthews spoke again for all of them. "There's not a thing in the world we wouldn't do for you, Craig. You know that. Ask us for anything you want that is within our capacity and we'll give it to you. The insolubility of this problem lies in the principle of indeterminacy. The equations—we'll give them to you if you like—contain over twenty indeterminate factors that would be required if an expression were to be obtained that would allow us even a conceivable picture of the exact nature of this catastrophe. You might as well ask us to sit at a table and write random, meaningless expressions for the next million years. We might accidentally stumble on the right expression, but that would be the only method of finding it. Ask us to do that, though, and we will, Craig."

"Thanks," said Craig.

The realization of the vast gap between the massed knowledge that they represented and his own relative ignorance—and the realization of their loyalty and understanding made him feel humble.

"Thanks," he said again. "I'm not likely to ask you to do anything as wild as that, but isn't it conceivable that we are all limited in a narrow rut by the depth of our past experiences? Isn't it conceivable that in existence there is some *principle,* some means of doing research, of solving problems that has never occurred to the mind of man?

"Our problem is basic. By all the rules and laws we know of, we are doomed. Personally, it matters little to any of us; it is only a relatively insignificant shortening of an existence perhaps not quite justified to continue anyway. But it goes beyond us. It involves the succession of the human race to the heights which have been dreamed for it since creation began.

"That is an obligation we can't say is relieved by the application of the principle of indeterminacy. Erase the principle of indeterminacy if necessary—"

He caught the look that crossed the faces of some of the men and subsided.

"All right, then, I'll hold you to your word—accepting Matthews' statement as applying to all of you. I'll let you know when I have something to work on."

"They think I'm a childish fool!" Craig stormed to Carlotta in his office.

"But they'll follow you blindly. Ask them to play sticks twenty-four hours a day and they'll do it for you. That's what you wanted, wasn't it?"

"I don't know. How can we tackle the problem with that kind of co-operation?"

"What did you mean when you spoke of a new principle?"

"I didn't mean anything. It was just a bone I threw out for them to chew on. There can't be any really new principles. They've all been thought of long ago."

"Brain teaming was a new principle fifteen years ago, wasn't it?"

"Yes—"

"There might be something that would make brain teaming look like the educational methods of the twentieth century."

"Nothing short of a mechanical brain would do that."

"Then why not a mechanical brain? It's not impossible, is it?"

"Until you psychologists can tell us the nature of thought, it is. Cartoonists have been drawing boiler tanks on stilts for nearly a millennium now and ascribing wonderful properties to their positronic brains and bellies full of storage cells. One has yet to be made."

"I'm serious, Craig. I'm not talking about that silly cartoon stuff, but look at the calculators we have. They can do almost everything but think. Perhaps your answer lies in the direction of a machine, at least."

He nodded soberly. "It's a thought—anything is, now. It would be worth setting the emergency team to."

He proposed to them the possibility of an improved calculator that would determine the needed factors. They admitted the possibility of improving the calculators they had, but they had no faith in their ability to accomplish the desired result by that means.

They worked like faithful dogs, but powered by their superior knowledge their work was deadened in conviction of foreordained failure.

He knew that the inspiration of the principle must come from his own brain—and he dredged deeply and found nothing.

Almost cut off from happenings in the outside world by the moment of his problem, it was only through a slow-filtering process that he learned that other space lines, though none operated at such distances as Maitland, had experienced the same type of trouble.

More than that, one ship had become entirely lost. Unable to locate itself or plot a course, the last radio messages had indicated that it was shuttling erratically about, searching endlessly for the unfindable route back to Earth. And then its radio had gone dead.

Craig knew what would happen. It would go on shuttling in hopeless attempts to navigate in a distorted and twisted space until the crew died of starvation. It was an event that aroused the lethargy of a well-fed civilization. Government investigation was ordered and the problem was thrown at Jamieson & Son by order of the committee.

It was only with difficulty that Craig convinced them that they were already at work on the problem and distributed plans for the compensated meters and indicators and the new radio circuits that had been devised to overcome the communication troubles.

Another occurrence or two of the same kind and the whole world would be brought to a realization of what was upon it. Carlotta had already shown him a picture of what that would result in.

In times past, saints and prophets had gone about in the world predicting the end and advising repentance and sale of all worldly goods. Little had come of such except a few nervous breakdowns of fanatical believers.

But never had a coldly scientific estimate of the immediate doom of Earth been given. In a civilization cultivated and bred on an infallible belief in the findings of its men of science, such a prediction would be wildfire. It would require no convincing of the populace. They would accept it in ready faith—faith that would sweep around the world with madness and hysteria. The picture was not pretty.

Craig lay awake at nights thinking of it. He dreamed of it. And every day the hidden pressure that squeezed in upon his brain seemed to increase. He knew he could not endure it much longer. He knew the twenty-four men of Jamieson & Son could not endure it forever despite all their apparent calm passivity.

And Carlotta knew it, too. She waited quietly, watching the hours and the days go by, helpless further to assist Craig.

He awoke one night after a ghastly dream in which he saw the Universe poised between two gigantic electrodes that slowly closed upon it from out of space. He sensed the incalcuable potential between those electrodes and watched, bound and helpless while they came nearer and nearer together.

But the blinding cataclysm of their arcing, which burned and shattered the Universe, left him a forlorn and dismal wanderer. And he knew that was not right. When collapse came he would go, too. But that was the one thing that no brain could truly imagine—its own extinction.

He awoke trembling and beaded with sweat. Then his mind settled again to incessant grinding over the problem.

He recalled the meeting when the emergency team had first been formed. He recalled the whimsical allegiance of the dried and lined-faced Matthews: "—ask us to sit at a table and write just random, meaningless expressions for the next million years. We might accidentally stumble on the right expression—Ask us to do that, though, and we will of course—"

It made him think of the ancient fable about the six monkeys who were given typewriters and allowed to strum at random for a million years. At the end of that time they had written all the books deposited in the British Museum, representing the genius of thousands of men.

Six monkeys—make it fifty million monkeys, he thought irrationally, and surpass all that man had done. Maybe six monkeys could surpass the efforts of the teams of Jamieson & Son—in time.

Fifty million monkeys—

He sat bolt upright in bed. The lights of the room flashed on as his feet touched the floor. Then he withdrew them and sat in darkness.

His mind sent groping tentacles of thought into a dim world of possibility that lay suddenly before him. Monkeys strumming at typewriters—scientists writing random expressions in hope of fortuitous accident.

It was meaningless. There was nothing tangible there. Yet something reached out from that senseless concept and gripped his mind relentlessly.

When dawn came he was hollow-eyed and moist with cold sweat. He dressed and ate mechanically and, while he did so, he put in a call to Fred Simmons, head of the company's department of service and supply.

"Fred—I want you to get me five hundred monkeys by noon today."

"Five— What was that you said?"

"You heard it. And empty out a basement room and arrange tables and chairs and five hundred electrowriters."

"But, chief," Fred wailed, "the monkeys—you want me to send out an expedition?"

"I don't care what you do. Buy, borrow, steal, or hatch them, but I want five hundred monkeys down in that basement room with the other stuff by noon."

"O. K., chief—just as you say."

Craig knew they'd be there if he'd asked for pink-tailed alligators.

Then he disappeared totally for three days—as far as Carlotta and the emergency team was concerned, and anybody else who tried to find him.

Carlotta found him on the fourth day of a frantic search. Soundlessly, she opened the door of the room in the depths of the basement. She stopped in sheer astonishment at what she saw.

Row on row, five hundred monkeys sat in ordered confusion before rows of five hundred electrowriters. Disconsolate, they pecked infrequently and indiscriminately at the keyboards. A dozen sweating zoological trainers moved among them, patiently trying to step up the output.

In a far corner, his back against the wall, Craig sat watching. A heap of yellow paper was piled beside his desk and figure-littered scratch pads covered the desk. Behind, on the wall, large sheets of graph paper were covered with meaningless curves.

"Craig!" Carlotta exclaimed. "What in the world—"

"Hello." He stirred.

"What in the world are you doing with these monkeys?"

"Writing the books of the British Museum."

She stared from him to the monkeys and back again in unbelieving bewilderment.

He rocked his chair away from the wall and stood up suddenly. He called to the trainers. "Take them away!"

The nearest man looked up at him,

startled. "But you said you wanted them at least six months. We've only begun . . . you can't expect—"

"I've seen all I need to know. Get them out of here. What do you want, Carlotta?" He started out the door with her.

"Craig, what are you doing with the monkeys?"

"I don't know yet— You wanted to see me?"

"I wanted to tell you that the lost spaceship has been found. It was accidentally discovered by a small freighter that seemed able to navigate even though the other ship wasn't. There might be new data there."

"Has the emergency team been given the information?"

"Yes, but they just tossed it off with a few equations and some talk about indeterminacy that was away over my head."

"We'll have to take their word for it. They're right—as far as their knowledge goes."

She glanced back through the open door where the muttering trainers were herding their charges back into their traveling pens. "Will you please tell me what all those monkeys are doing?"

"I don't know—honestly. Carlotta, did you ever hear the legend of the monkeys that were given typewriters for a million years and wrote all the books in the British Museum?"

"Yes, of course, but— Craig, you're not—" She looked back wildly, as if doubting his sanity.

"Forget the monkeys," he snapped. "They're not important. The principle of the thing is what I'm after—random association of semantically meaningful characters. I've been running frequency curves on what the monkeys have been doing, but there's absolutely no trend evident. The number of associations is too infinitesimal. It *would* take a million years to find out if there were anything here or not.

"But is it possible that there is a truth here? Could all the books of the British Museum—whatever that mythical place might have been—be written in such a manner? Can psychology tell me?"

She shook her head slowly. "The random selection of semantic symbols will obviously result in fortuitous combinations in time—but what would it mean, if anything? I should think it would be mathematically impossible to prove or disprove the possibility of actually obtaining any number of meaningful combinations. Certainly, psychology has nothing to say except that it is merely conceivable."

"You're right about that math part. I guess it's a fool idea to begin with. But look—suppose you had a box whose inside you could reach into, yet could not see. Suppose there were a million black disks in there and six red ones, which you wanted to separate. You could begin patiently taking them out one by one. Eventually you would have a pile of useless material, but you would have the red disks that you wanted.

"Suppose that random semantic combinations could be made at terrific speed. A mountain of useless gibberish would be produced, but what might be found among it that made sense?"

"I don't know. It . . . it just doesn't sound feasible." She looked up and rushed on, "but follow it through, Craig. Maybe there's *something* there—something that we can't quite conceive because it's so strange to our minds. Follow it up. Perhaps there is buried there the principle you spoke of the other day."

"It would be a queer principle," Craig mused. "The principle of randomness."

He still hesitated about revealing his work to anyone else. He kept the emergency team at the problem of improving their calculators while he went ahead, groping blindly for some clue to the possibilities he sensed lying buried in the fable of the typing monkeys.

The next morning he called Jack Harrison of the instrument shop. Jack was an artist in brass and bronze and small precision instruments, but a dolt on any math beyond elementary calculus. The combination made him invaluable to Jamieson & Son. He never asked questions.

"Hi, chief." He breezed in, responding to Craig's call.

"Hello, Jack. Sit down. I've got a special rush job I want you to turn out. Can you give me the whole shop for a couple of days?"

"Gosh, there's those automatic spectro-analyzers for Midland Chemical."

"They can wait. Is that all?"

"Yes—except for—"

"Skip it. Look, I want you to take those five hundred electrowriters down in Room B-198 and fit a device to each one of them that will pound the keys continuously and at random."

"That all?" Jack looked at him queerly.

"That's all—but it's not as simple as it looks. There must be no cyclic recurrence of typing whatsoever. It must be absolutely at random."

"That's hardly possible. Almost any impulse generator you can think of is bound to have a cyclic recurrence somewhere in it, regardless of how complicated."

"How does this sound? Support a ball in a turbulent column of air. Let the ball intercept a light beam of shifting intensity. The resulting combined impulse could be applied to control the air column of the next unit. Put five hundred of them in a circle with the impulses controlling the electrowriters taken off between units."

"Sounds O. K. That's about as near to random as anything I can think of. But I'll bet it develops a resonant somehow. Will day after tomorrow be soon enough?"

Carlotta's voice burst crystallike in the room as Jack Harrison left with his instructions.

"Craig!"

"Hello." He turned on her image in the miniature plate before him. "What is it?"

"Matthews. I've just made a prediction on him. You've got to get to him. He's cracking. He can't go on under the strain of facing an insoluble mathematical problem of this nature. He's going to react."

"What will he do?"

"He will try to reveal the knowledge to the public and set himself up as an authority and leader in the crisis. The probability is about ninety-eight that he will propose an attempt to escape in a vast space fleet. He will be successful in organizing such an attempt unless you get to him."

Craig felt heartsick. Matthews—his ace mathematician. To lose him would be cutting off an arm, a badly needed arm.

"I can't loose him now—just when I'm about ready to ask the team to go to work on this random thing. What shall I do?"

"Ask him to help you. If he can become convinced that there is a scientifically plausible solution he will balance up again. But there is the factor of uncertainty—trying to convince him of that."

"How long have I got?"

"About eighteen hours."

"I'll try it."

As unready as he was, he knew there was but a single possibility. He would have to gamble on the appeal of the random concept to the old mathematician's mind.

He left his office and took one of the small monocycles that would follow a direct and uninterrupted beam to the desired destination. In five minutes he was at Matthews' office.

The old man looked startled as he walked in. He turned from the bank of calculating machines that occupied one entire side of the room.

"Hello, chief. What brings you over in this end of the building? Kind of out of your normal stamping grounds, isn't it?"

His beginning disintegration was obvious, even to Craig, untrained in psychology. He ignored it and sat down on a high stool before a plate of keys.

"I wanted to see you privately. I want your opinion on something. I think I've got what will lick this thing if we can only work it out."

Swiftly he explained the concept that was burning with its uncertain flame in his brain. Matthews listened at first with the dubiousness of superior knowledge. His mind, long accustomed to the brightly lit channels of orthodox mathematical theory trembled on the verge of this dark, winding abyss that Craig revealed to it.

Randomness!

Then he perceived the fullness of the concept and trembled visibly. "Craig—boy—" He laid a bony hand on Craig's shoulder. "You've found a new world . . . a new world—"

He went on, his eyes dreamy now and faraway. "I see it. It's a machine we need. A great vast machine that will associate thousands of millions of any conceivable type of semantic abstractions in a day. And we need a means of selecting automatically the resulting concepts that have rational meaning. There is our problem—the construction of a proper selector—"

"I don't see—" Craig began.

But he *did* see as Matthews continued. "You'd have an enormous mass of meaningless garble and an infinitesimal amount of useful material. It would be an impossible task to make a selection manually. The stuff must be selected out before it is even produced. Attach the device to your impulse generator to kill the meaningless associations before they are even written down."

That was it. At one jump Matthews had cleared Craig's highest hurdle for him. It was useless for him to grope blindly at this thing any longer. The teams would be ready for it.

"Craig," Matthews was murmuring, "I think we've got something here that's been lying under the noses of scientists for a thousand years."

Escape fleets to space were forgotten.

The emergency team accepted the proposed concept with the same ardor that Matthews exhibited. Craig knew that they saw far more in it now than even he did, because each of their highly intensified intellects visioned the myriad possibilities in its own field, possibilities at which Craig could only faintly guess.

Only the members of Team Thirty-four were somewhat chill in their reception of the idea. Craig met with them alone afterward.

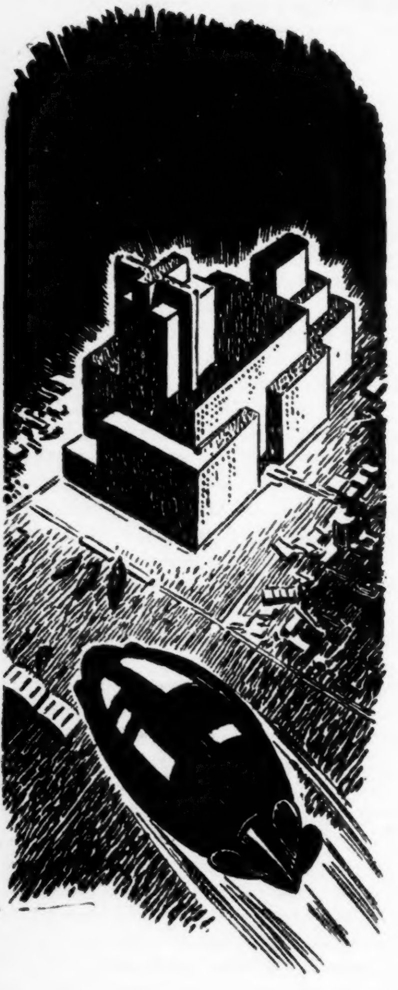
"You don't like it," he said. "Give out."

"We think it's swell—from a standpoint of pure science," said George French. "But it's useless as far as the impending spatial collapse is concerned. Randomness is a suitable project for a century of research, but we've developed a little expression showing how much time we have to work. As near as we can tell it lies between six and ten months. Your concept of randomness is brilliant—brilliant, but the time element involved is too vast and uncertain to give us any confidence that it will do us any good."

Craig considered their pessimism. "I guess I'm what my mother used to call one of the 'fat, happy little people of the Earth' who *believe*. Your analysis offers an absolute zero chance of man's survival. We know nothing of the chances offered by randomness. So, *I believe* we have a sufficient chance to succeed."

Even while the simple random device in the basement, which Jack Harrison had built, was pouring out gibberish at top speed on the electrowriters and the technicians were running frequency curves on the results to obtain, if possible, some insight into the laws of randomness, a larger and greater machine was being designed and built.

Instead of typing mere letters, this machine was equipped with a vocbulary



of over half a million words and designed to type them whole.

At the same time, Matthews was designing another machine to operate solely with mathematical concepts. Instead of words, his semantic units were mathematical functions, more difficult to handle because the functions inserted into the machine were directly related to the mental experience of the men devising them, yet it was only by the use of such functions that any fortuitous combinations of the random machine could be interpreted.

The same thing was true to a lesser extent of the word machine, but using single words, it would still be capable of creating units of conception unknown to man at present.

The machines were ready in three weeks—but without the semantic selector, which had proved more difficult of design than anticipated.

Four large basement rooms had been carved out and combined to accommodate the machines. Their multiple rows of type faces stretched endlessly between the distant walls. They were like rows of queerly decorated columns reaching to the high ceiling. Between the tightly packed units, streams of yellow paper poured at a speed of forty miles an hour.

Craig decided on a preliminary test before the selector circuit was ready.

The clash of type face on back plate made an incessant roar that poured from the machines like the wildly flowing ribbons of paper. Speech was impossible in the room without audio aids which the members of the emergency team wore.

As the paper poured from the machines it was rolled and clipped and trundled automatically away to an ever-mounting stack of—sheer gibberish.

It was what they expected, of course, but Craig felt a moment's uncertainty as he examined the first neatly bound rolls. He placed one upon a pair of spindles that allowed him to view the material as he unrolled it.

In all that vast production there was not a combination that made semantic sense.

He grimaced at Carlotta. "Guess the monkeys' I. Q. is rather lower than we thought."

"Look— Here's one!" Carlotta cried. She was unrolling a second roll of paper. She pointed to a single line in the middle of it.

"The man and," Craig read. "The laws of chance would probably give

good odds for such a simple combination," he said, "but I believe that semantic combinations do not follow the ordinary, so-called laws of chance. That was definitely proven nearly ten centuries ago by those curious 'espers' who thought they had found some mysterious means of thought transmission. They had their toes right on the threshold of randomness and never knew it."

He surveyed the mass of rolled paper that was stacking up, bearing gibberish —and the hope of a new world of science. The mass was useless in its present form. The gibberish and the meaningful would be inseparable. There had to be a mechanical separation before the principle of randomness would be of any value whatever.

"We might as well turn this off until we get the semantic selector completed," he suggested.

It was impossible to keep the news from the rest of the teams in the building that something big was going on. No attempt was made to do so, now. That was farthest from Craig's mind. Once the possibility of exploring the laws of randomness was fixed in his mind, he threw the concept and its problems open to all the teams—keeping secret only the impending catastrophe that they were fighting so desperately and secretly to prevent.

There was not a team that did not see instantly the strength and power of the concept of randomness. They could not be held to the immediate commercial problems that engaged them. Their minds flung ahead into the wild expanse of the unknown world of random and a thousand possibilities that Craig had never dreamed of were opened to him by the power of their intellects.

Yet, never for a minute did the burden he bore relax its killing pressure.

Six to ten months, Team Thirty-four had said. One of those precious months had already vanished and only the barest start had been made along a path that might end light years from their goal.

The emergency team worked twenty hours a day between their designing on the random machines and trying to solve the problem of the spatial collapse on their own improved calculators.

All Craig's hopes rested now in the semantic selector circuit. It was ready for trial in another week. If they could not build such a device successfully, they would be like pygmies trying to wield tools built for Goliath.

The selector had presented almost insurmountable problems. They could not limit its selection merely to combinations that they could anticipate would be meaningful—that would have been as useless as preselecting whole concepts and introducing them bodily into the random machine. Yet they had to eliminate the bulk of the gibberish.

A compromise was made by restricting the multiple association of nouns, verbs, and other classifications of words which would be obvious gibberish. It was a backward working method, but it was the best they could do.

Though the tremendous urgency that motivated the emergency team was not present throughout the entire building, all the teams seemed to partake of the tenseness that was present when the selector was finally completed and installed.

With only the emergency team present, Craig threw the machine into operation. He started the giant random typer first without the selector circuit controlling it. The vast din of the hammering type faces and the scream of the flowing paper echoed in the vaultlike chamber. Then he threw in the selector circuit.

The din died instantly. The machine stopped.

Craig looked blankly around. The members of the emergency team scanned the controls of the machine.

"What happened?" Craig asked. "We must have blown out part of the circuit."

Hal Epps made a quick check of the control meters. "All voltages are normal," he announced. "No reason why it shouldn't be pounding it out."

As he spoke there came from somewhere in the depths of the machine a single click of a falling type face.

"What caused that?" Craig looked quickly in the direction from which the sound had come and slipped into the narrow aisle between the towering columns.

He located the source and saw the paper had moved a fraction and even now was edging along. By craning his neck he saw the single word "xylophone" printed on it.

He was baffled. There was utterly no reason why the machine should have stopped its pounding away.

Then Carlotta spoke up. "Craig—don't you see? There's nothing wrong with the machine. It's still functioning."

"What do you mean? It's stopped, hasn't it?"

"No, it's still running. Your random impulses are still being fed into the type circuits, but the selector kills them before they act—because they are semantically meaningless."

"But that would mean—" Craig gasped.

"It would mean that the total quantity of relevant material coming out of the machine is an insignificant dribble."

They all saw it simultaneously. The laws of randomness were directly related to time and the period between selections having semantic meaning was inexorably long.

"We'll need ten thousand machines the size of this one," said George French slowly.

"We'll get them," Craig answered in a quiet voice. "We'll get them."

Better results for reasons not quite understood by any of the teams were obtained with the mathematical unit, which was the most important, anyway.

It functioned slowly but with relative sureness once the semantic selector was connected in its controlling circuits. As far as new results went there was nothing of note, but what it did give out was meaningful. It got started off on the concept of the sum and difference of two numbers and ended up with the development of the binomial theorem within a period of three days.

Not a man in the building did not feel awed by this phenomenal result. They felt akin to the great ones of the world such as the ancient Faraday and Henry and the Curies who had gone ahead blindly with discoveries that fashioned a world, unaware of the great work they were doing.

It seemed almost that even the emergency team had partially forgotten the tremendous pressure that was upon them, the end result that they were seeking. They were Archimedes drawing on the sand barely realizing and not caring that the world should end about them while a new and wonderful world opened before their eyes.

At the end of another week, the first stumbling sentence had been completed by the word machine. Carlotta brought it to Craig's office after waiting for hours for the appearance of the final word.

He stared at the yellow sheet for a long time. It read, "Xylophone music played and the schizophrenic danced wildly."

He looked up ruefully. "I guess that just about does it, doesn't it?"

"But if we *have* discovered any of the laws of randomness this must have some meaning."

"Definite, but not connotative. Somehow we'll have to improve the selector. The shop has nearly finished some revisions that will permit the generating impulses to be fed in nearly a hundred thousand times their present speed. That ought to step up the output greatly. We'll see, then, if we have anything."

That same afternoon Matthews and eight other of the crack mathematicians from separate teams entered his office. Matthews threw a sheaf of papers on his desk. Craig frowned at them.

"What's this?"

"We may be crazy, but we want you

to have a look at this and give us permission to go ahead with a little revision of the random machines."

Craig scanned the sheets. He turned over three or four, following through some elementary field mechanics developments. Then he came up against a blank wall. A page of totally foreign work appeared before him. Foreign not only as to manipulation, but as to symbol, also.

"I can't read this stuff and you know it." Craig stared at them irritably. "What is it?"

"But you agree with everything up to there? That last development of Equation Thirty-six is all right?"

"Yes, sure. That's elementary."

"What follows is merely substitution of certain expressions in Equation Thirty-six."

"But what are the expressions? Where did they come from?"

"They came out of the random machine and we worked them up a little further on our calculators. Look at the last page now and see if you can interpret it as we do when we substitute back into familiar expressions."

Craig leafed over the sheets and came to the last one. He sped through the crystal-clear manipulations, checked a point or two on his desk calculator.

"It looks all right. I think—" he began. Then he stopped. His eyes stared at the results as the full implication struck at his brain.

"This is impossible! You've made a mistake back here in this gibberish somewhere."

"We'll vouch for that," said Matthews quietly. "We'd like to incorporate that final result in a random machine."

Craig stared at them again. "If this is true—it will mean that it is possible to control the temporal rate of selection relative to our own experience. Time control—time traveling—the fantasy of the ages."

"Hold it," said Matthews. "It doesn't go quite that far. As far as we can tell, this is explicitly a law of randomness. It does not mean time traveling in any sense of the word, but in crude terms it does allow us to compress the equivalent of a million years of random selection by one of the machines into a few seconds of our own experience. It means that—that, and nothing more."

"As if that weren't enough!" Craig breathed fervently.

He sat in meditation after they had gone. Time control. The critical factor in the science of randomness. And now it appeared to be within their grasp. Surely now there could be nothing barring their way to mastery of this science.

He felt again the sweep of that overwhelming yearning that had tormented his earlier years. The urge that Carlotta had so rightly defined—the urge to go *everywhere,* to know *everything.* Perhaps, somehow, the principle of randomness would lead even to that.

The details of the work passed rapidly from his hands. The teams seized upon the randomness principle like hungry men at the sight of food, and their minds literally fed on it—on the vastness, the expanse of the world of whose existence they were not even certain.

Team Sixty-nine, a chemical group, proposed the application of the principle to chemical science. They suggested a machine with combination of chemical equations and symbols—controlled by a selector that would eliminate the known impossible reactions.

Already they had at their command a predictor, a machine for evaluating the valences, seats of reaction, and the physical factors of temperature and pressure involved in any proposed reaction. By linking a predictor with a random machine a new world of chemistry appeared feasible.

He gave them the go ahead.

And all the time the pressure upon him grew greater. The uncertain six or ten months narrowed by three. No more spaceships were lost, due to the modified instruments of Jamieson & Son. But erratic astronomical phenomena were being observed throughout the galaxy.

Universes appeared to be in the process of wild creation and destruction throughout all space. Scientists flowed daily through the corridors of Jamieson & Son, but Craig would offer no help to any of them, or even see them. He turned them all away, praying that none would guess the truth before some solution was found.

The change over to the use of increased impulse frequency and the time control involved radical changes in the equipment. No longer could observers wander at will between the close packed pillars of the typing units while they functioned.

The time control involved their being bathed in powerful and humanly destructive energy fields. Eighteen feet of solid lead surrounded all sides of the vaultlike room in the basement.

When this work was completed, Craig abandoned his interest in the word machine and concentrated all his energies in participating with the emergency team in their work with the mathematical machine, for only in that direction could any hope of salvation lie.

But Carlotta did not understand what the latter machine was doing while she was fascinated by the word machine.

Most of what came out now made semantic sense—after a fashion. The thought and phrases were distorted and disconnected. Yet occasionally there seemed to be a thin thread of meaning running through large chunks of it.

Sometimes it seemed as if she were reading a very badly translated work originally written in a very beautiful foreign language.

With Craig's permission she hired a large staff to sort and segregate the material that came out of the machine. After a time there seemed to be a long period of fantastic conceptions that had no meaning whatever in terms of earthly experience.

She found such expressions as "the man who walked on the ceiling," "the blue cartridge led a happy life," and once she found repeated the weird assertion that "xylophone music played while the schizophrenic danced."

Either this was in itself more sheer gibberish or it would admit of sane translation. She determined to find out.

When she did she did not know whether to be thrilled or horrified.

She called Craig.

"Here's what your fifty million monkeys have been doing the last eight weeks." She pointed to two six-inch piles of manuscript as he entered her office and sat at the desk.

"Have you been able to make any sense out of it?"

"Yes. It's weird. It's unbelievable. Sometimes I think we ought to shut that thing off. Some of the things it writes should never have been written. I know it's only a pile of machinery, but sometimes it actually scares me. It acts almost like a brain, an utterly foreign brain."

Craig snorted. "You'll be picking dandelions off the light buttons next, if you keep that up."

She could see his nerves were badly frayed, too. He moved jerkily as he reached for one of the piles and read the cover page. He scowled.

"What this? 'The Romance of the Man Who . . . Time Fields and the Girl Who . . . Dress Designs.' "

"It's a novel, I think. Your monkeys wrote it."

He scanned through the pages, glanced at the distorted expressions. "This doesn't mean a thing. Ten percent of it is nothing but blanks. What are they for?"

"The machine put in whole long phrases that it had no vocabulary for. No words exist for them in our language. For example, the word before 'Dress' there was expressed by, 'took seven whorls of stardust and melted sea down into.' "

"I only hope our math works out better than this. You mean to tell me you've put a lot of this junk together and you think it makes a connected story?"

"I think so. I feel reasonably sure of it. If all those expressions could be accurately translated into English words, I think you would have a very interesting, well developed story. Actually, I think the machine was more or less experimenting on that."

"You talk as if the machine had volition of its own."

"Maybe it has—volition obedient to the laws of random."

He shook his head slowly. "You're going into this more deeply than any of the teams. You can't ascribe such properties as volition to the machine. I am certain of that."

She picked up the other pile of manuscript. "Then suppose you take this with you. Read it through and see if you still think that."

He picked up the second sheaf and scanned the cover. "Scott's 'History of Mankind.' "

"What's this?" He turned over the page and began reading, skimming at first then more slowly, word by word, and the strange and exotic meanings gripped him. An aura, an essence of meaning beyond the known connotations of the words seemed to reach out and clench his mind. Carlotta watched him solemnly as he read. At last he looked up.

"What in the world is it, anyway? It's not history as we know it. It didn't happen that way—the part that appears to be in the past, at least. Yet some of it did—who is this Scott?"

Then he laughed abruptly and heartily. "Here I go talking as if this were a real history written by a real man, instead of a bunch of words thrown together by a machine!"

His laughter was short-lived. Something of those first few pages of manuscript burned in his mind. "This sort of gets you, doesn't it?"

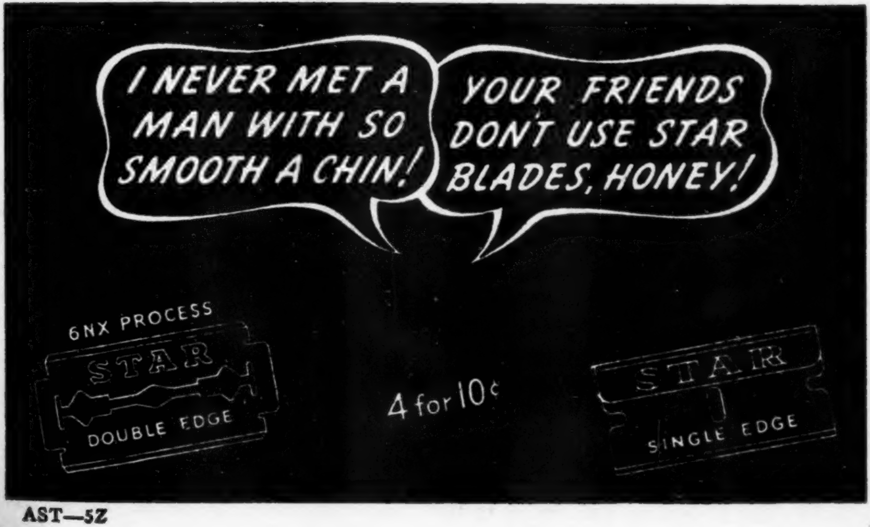
"I wonder if it isn't possible that it is a real history—written by a real man," said Carlotta slowly.

"What do you mean?"

"Look at it this way . . . of course I don't know anything about the laws or the science of randomness, but I don't think any of the rest of you do, either—"

Craig nodded wry assent.

"Scientists' lighter moments have often conceived the possibility of simul-


I NEVER MET A MAN WITH SO SMOOTH A CHIN!
YOUR FRIENDS DON'T USE STAR BLADES, HONEY!
6NX PROCESS
STAR
DOUBLE EDGE
4 for 10¢
STAR
SINGLE EDGE

taneous worlds in different times or on different planes of existence. But this has remained pure fantasy. Suppose the truth is that there are multiple worlds—possible worlds of random. Suppose Scott lived in such a world, that his history did transpire, or will, or *can?*

"Suppose it is the history of a world that the Stillson motor catastrophe didn't wipe out. Suppose it is the history of a world that can exist in the *something* that must be formed when the collapse of space takes place."

Craig looked at her dreaming, faraway eyes. "And suppose we might find some clue here as to how *we* can become that world. Is that what you mean to say?"

Carlotta nodded. "It's fantastic, I know. But so is this whole business. Fifty million monkeys—that machine—writing books—

"And that history—it's a ghastly, terrible story, Craig. It begins in a golden age, but the middle part is horrible. I think if mankind knew it was to pass through that, it would rather die, even though the end promises faint hope of resurrection."

Craig rose, the manuscript under his arm. "I don't know. Anything is possible. We are dealing with laws and probabilities that may be beyond the capacity of man to understand. So simple and yet so abstract and complicated, the laws of randomness appear beyond comprehension. Our work in math has shown us unbelievable things."

Craig did not intend to read Scott's "History of Mankind." He knew it was utterly irrational to suppose that such a creation could have any significance whatever.

But that night in the apartment he had taken for himself in the building since the desperate task began, he could not sleep. His thoughts gyrated about a mysterious historian who had never lived and who wrote of a world that had never existed.

At last he got up and settled to the reading of the manuscript. Despite Carlotta's assertion that she had translated it into clear English, there were phrases, connotations, and twists of thought that made it seem as if he were reading through a distorting prism.

The first half told of a golden world where an era of vast scientific culture had produced a near Utopia. It was a description almost of Craig's own world before the coming of the Stillson threat.

But there was something entirely out of the world about the History. This was due in part, but only in part, to the fact that it was a translation. Carlotta had been rather free in her word substitution, though she had appended a glossary of originals and substitutes.

Earth, for example, was always called the Third Planet, even though the word was in the vocabulary of the machine. Other nouns were not used, as if the historian, Scott, had never known those particular words—as if his world had not been actually Earth, but a queerly parallel existence, Craig thought.

And then a dread and somber note cut off all semblance of Utopia. In the book it was called only the Breaking of the Law. Throughout the entire History, Craig was unable to determine exactly what it referred to.

It was only the Breaking of the Law, an unknown act on the part of a race, that brought an intolerable terror and heartbreak to a world.

Though Craig was utterly baffled by any attempt to identify the nature of the tragedy and even more bewildered by the effects of it, he was not immune to the cold horror written on those pages. The unknown historian, Scott—who had never existed—painted with a brush dipped in ice water, whose touch was fire that burned at the roots of the cortex.

One page near the middle told of the beginnings of the horrors.

"After the days of the hungry ones came the Paralytic Year. It was first observed in the Great City on the fourteen of four of thirty eleven. During the morning of that day several persons were found standing upon the streets, entirely unmoving and unable to move. They stared ahead with a look of despair upon their unchanging faces. They could not be persuaded to move or make any intelligent sign and when they were moved to hospitals they responded to no stimulus whatever.

"Through that night and during the next day, the condition spread to other cities and by nightfall of the second day a million of the paralytics were stone rigid.

"It was, of course, impossible to locate all or even a small part of the unfortunates, especially in isolated districts. The majority of them remained where they were stricken, and as the days passed, they simply starved to death. They toppled where they stood, dying in an agony that could not express. Their corpses were everywhere. During that one terrible year over three hundred million died in that fashion.

"What it was or where it came from, no one ever knew. It was only another of the results of the Broken Law. Again the Light Master appeared in all the stricken cities throughout the world, and men hid their faces from the being. It touched the dead and stricken and a new plague of horrors swept over the world. Some were winged creatures that were seen to fly only against the Moon in the great cities. Others became crawling things that oozed into the sea and were drowned. Still others slunk about the street, mere rotting corpses that seemed possessed of some unknown, unholy mobility."

When Craig finished the History, it was morning and the night was gone.

The financial manager of Jamieson & Son was a frumpy little man who sniffed constantly and rubbed a perpetually itching nose with the back of his hand.

He was waiting for Craig next morning in the office, and his presence sent a premonition charging through him. Peyton's presence always symbolized financial difficulties. But surely the finances of the company were not in any difficulty now—

"Come in," he said.

"I don't like to say this, Craig," he began, taking a seat, "but I think your father will seriously disapprove some of this wild spending you are doing."

"What are you talking about? The random machines have cost comparatively little."

"It isn't the first cost—it's the upkeep."

"That's practically zero."

"Not in the chemical section. Look at these vouchers." He passed over a sheaf of pink and yellow flimsies.

Craig glanced at them. Bills for hundreds of tons of chemicals. Vast quantities of thousands of compounds and elements—materials that the company couldn't use up in a hundred years of research. And a total price that staggered him.

"There's a mistake. This stuff was never sent to us. We couldn't possibly use it."

"It was shipped, all right—and received."

"But what has become of it?"

"I don't know. All I know is that the chemical section wants still more. They say they need it for their random experiments. I kept signing the vouchers as long as I could. But it's gone too far. I don't have the authority to give them any more."

"I'll take care of these." Craig picked up the vouchers. "Don't authorize any more until you hear from me."

Chris Holmgren, spokesman for Team Sixty-nine, was a big, blond-headed kid of twenty-eight, the second youngest man in Jamieson & Son.

He answered the wristphone call. He flushed and his fair skin became an almost fiery red as he looked at Craig from the deskplate.

"I guess this is the payoff, huh, chief? I thought you'd catch up with us sooner or later. Well, come on up—I think we can show you what we've got now." He flicked off.

Craig tried to call back, but there was no answer. Damned insolent kid! Swearing heartily under his breath, Craig hurried into the hall and mounted an automatic monocycle that carried him a mile of corridor in a minute and a half.

He had not been in that section of the building for two or three years, but instantly he sensed something wrong when he entered the corridor. The building had been modified.

Team Sixty-nine were waiting for him as he entered the room where he knew their office to be. They grinned like sheepish schoolboys at his reaction.

The room was *vast*. They had taken over half the floor and knocked out the intervening walls to make one huge chamber to accommodate the machine.

"How do you like it?" Chris asked tentatively. "This is our chemical random machine with modifications—"

Modifications—Craig breathed to himself. It was a major engineering feat.

"We found out how to get along without the lead shielding," said Chris. "We substituted a counteracting field instead which enables you to walk right among the parts of the machine while it is working. Try this on and I'll show you."

He extended a small shoulder pack and helped Craig into it. At the touch of a switch, a faint green aura surrounded them. Craig followed as Chris led the way down the aisles between huge blocks of interconnected machines which bore no resemblance to anything with which Craig was familiar. They came at last to the central part where, hidden by a forest of other towering machines, a squat, massive unit lay housed like some fantastic head with hair standing on end. Hair formed by thousands of connecting tubes and cables leading down into it.

"What is all this?" Craig was at last forced to express his bewilderment—and his anger, "and why the terrific expense account for chemicals—"

"You remember we started out with random combination of chemical symbols and equations," said Chris carefully. "That was good enough, but actually there are hundreds of factors for which no accurate prediction can be made. We got some interesting new formulas and processes out of the machine and tried to make them up. Some worked and some didn't—and we wasted a lot of time for nothing. So we gradually got the idea that there was no reason for doing merely paper chemistry by random."

Craig looked at him startled—and at the squat, impassive unit in front of them. "You mean—"

"I mean why not do actual chemistry at random—instead of paper chemistry? This is it."

Craig stared at the machinery about him. Here was a concept of randomness that had utterly escaped him. He would not have believed it possible.

As if reading his mind, Chris said, "We didn't ask your permission because we didn't believe it would be possible, ourselves. It was only a dream we had, but it worked. I knew the cost of materials would catch us up sooner or later. We salvage most of the waste products, but even at that the rate of loss over an effective period of several million years is rather high. We've only started, but what we have already will foot the bill for a hundred years' operation.

"You should see the transparent steel that we have, and the whole new series of artificial foods. Do they make your mouth water!"

Farther and farther into the unknown Craig watched his concept expanding. Here was the ultimate application of randomness. But through his mind flashed the momentary thought that this was only a toy compared with the machine that *could* be developed—a machine to work not merely on chemical combinations alone, but on all physical, mathematical and energy principles known to man. A giant, creative machine out of which a new, impregnable, immeasurably bright and happy world would come.

But there would never be time for that, now—unless—

He turned to Chris. "Go ahead," he said softly. "I'll foot the bills until we get some of this stuff on a commercial basis."

Two weeks to four months.

The odds in favor of the longer period were good, Team Thirty-four said. Yet slowly, at an ever-accelerating rate, Craig began to despair of finding a solution to the problem of spatial collapse.

It was as Team Thirty-four had said, the time element was too great even with the time control which they possessed. Though randomness had shown them thousands of undreamed-of wonders, the chance of finding the one specific thing they were looking for was infinitesimal.

Insomnia increased its hold on Craig and he spent his nights, when all the others were gone, sitting before the mathematical machine pondering its mysteries and staring at the output on the slowly unwinding ribbon of paper.

A week after he had seen the machine of the chemical team, his sleeplessness had become maddening. The concept of a universal random machine operating with all the forces available to man was growing slowly in his brain—and with it the conviction that they were doomed to failure and he would never get to build such a machine.

He went down to the basement room where the mathematical machine was located. In crimson dressing robe and flopping shoes he stared at it like some aborigine whose stone god remains perpetually dumb.

What was needed, he thought, was something to correspond to the chemical predictors which were used upstairs. If there were some means of restricting the machines' operation to specified channels instead of loosely wandering among all the conceptions of mathematics—

A sudden throbbing filled his body. Why hadn't they thought of that before? A mathematical predictor could be as useful as a chemical one. Its form would be simple. It need be nothing more than one of their newly devised calculators.

He threw aside the robe and hurried out to a materials storage and tool room nearby. He returned with tools and conductor cable. Then for six hours he worked in a sweating fury, devising and connecting a makeshift circuit to connect the selector of the random machine in series with an adjacent calculator. He had to revise circuits in the latter to permit a holding effect that would limit the channels of operation of the selector —not limit it strictly, guide it.

It was nearly dawn when the last connection was made and he threw in the switch that resumed operation of the random machine. It began a steady, irrelevant production again.

Then he took one set of equations involving a single factor of the twenty-odd indeterminates. He pressed the holding key—and the machine stopped.

His shoulders slumped in despair.

Time again.

Though a million years passed while he stood there with his fingers on the key, it was still not long enough to find the answer to those equations by the laws of randomness.

He made a move to clear the board and try another set, but before his hand could complete the motion a sudden, sporadic hammering of type faces came from the machine.

Excitement welled up within him. Here it was! He set the lock on the calculator keyboard and sat down before the unwinding paper.

But as he watched, dismay seized him. There was nothing there—nothing that made sense. It was the worst gibberish the machine had ever turned out. All he had succeeded in doing was so interfering with the laws of randomness that nothing semantically meaningful could be produced.

In a despairing fury he ripped away the sheet of uselessly jumbled mathematical symbols and threw it in a corner. With utter wearines of mind and body he returned to his room and put a sleeping cap on his head. He set the insidious, habit-forming mechanism for twenty-four hours and shortly became unconscious.

There were those gleaming, gigantic electrodes filling the Universe again. Imperceptibly, but inexorably they drew closer together. The vastness of galaxies was crushing together between those poles and the incomprehensible potential between them could be felt in the strain they made upon space itself.

They arced!

Blinding, shattering light fired the Universe in a coruscation of death and torment.

Craig knew this was death. Death at last. He would not be left to see the vast, incredible emptiness that would follow the devastation.

But out of the blackness that followed, light began to grow. It swam in multihued spirals, darting about him in sensations that made him spin with vertigo.

As he rose through a whirlpool of light and sickness he heard dimly a voice crying urgently into his ear. Curiously, it was the voice of Carlotta, but he could see no one. He wondered if she had died, too.

Then he saw her. She swam toward him and the vision began to clear. And in her hand he saw a curious, caplike object.

He knew. She had wakened him—removed the sleeping cap before it had run its course. He wondered why she had done that to him. Such shock was frequently enough to shatter a mind.

"Craig—wake—" she was saying softly. He knew her voice was coming through a counter-hypnocap.

"I am awake. What do you want?" he said.

But he was not—fully. There was a time of silence, while the vision of her face became clearer. And then he heard another voice. "Is he all right now?"

It was the voice of Matthews.

"Yes, you can talk to him now," Carlotta answered.

Craig sat up and the full faculties of his brain felt restored. Matthews' old face was aglow as with the joy of new youth. Craig wondered what had come over him as the sinking sense of failure began to steal over him again.

"We've got it," Matthews said quietly. "*You've* got it—"

"What?"

"The answer. You must have been inspired in what you did last night. Apparently after you set up the machine in that fashion, it kept pounding out at intervals and by the time we got in it had solved one of the indeterminates. We've got it working on the rest now. By night we should have them."

Craig knew he was staring openmouthed and senselessly, but he couldn't believe it.

"The thing was only pouring out gibberish when I left!"

"That's what you thought. That's what we all thought. We saw the piece you threw away. In that was the key to the whole thing.

"You have uncovered another of the laws of randomness with that hookup you devised. We would never in all eternity have found the solution we were looking for without that hookup."

"I don't understand."

"Come down and we'll show you."

Craig dressed and followed the way down to the basement room again. He found the air tense with the excitement of the members of the emergency team who were grouped around the machines now. He saw they had technicians shifting in more calculators and cabling the keyboards to the random machine.

"For the final result in obtaining an expression that contains all the factors we will need a set of equations for each one set up on separate keyboards and controlling the selector.

The reason we failed to find the answer before was that no mathematical means of doing so was in existence. Last night, when you limited the random selections to the narrow channels of the equations containing the one factor you chose, you brought into operation another law of randomness. That law so held that though none of the mathematical machinery for solving the problem had been incorporated into our circuits the problem was solved by first creating the means.

"We have created a system of calculation as far above anything we had before as the calculus of variation is above abacus counting. With that new mathematical machinery the random machine is solving our problem."

"How did you even recognize it?" asked Craig. "It was only gibberish to me."

"I just started fooling around with it to see if there might be something there."

Craig knew what meaning lay behind Matthews' simple statement. He knew that no other brain or any group of brains in Jamieson & Son could have recognized that unreadable conglomeration for a new system of mathematics. He knew that without the genius of Matthews in recognizing the material for what it was that the world might have been lost.

There was still a long way to go, and they all knew it, but they felt certain they were in the final round. Yet, creeping up from the depths of their minds was the paralyzing fear lest they fail by a few days or even a few hours.

The machine did not develop all their equations by the end of that day or the end of the next one. But none of them left the room. For more than eighty hours, they remained there watching the slow production of a new world of mathematics.

At last it came time to set up the separate equations on the many keyboards and hold them all in control of the random selector. When they turned the power on, the machine remained silent and immobile.

For six endless hours there was not a movement of a relay or a type face. Wearied, they began to wonder if they had failed in the one last step. Then slowly the paper began to unroll out of the machine. At a rate of hardly more than two or three impressions a minute, the expressions began to appear. Then, at the end of ten more hours, the long awaited solution was in their hands.

"This is it," said Matthews calmly. "Get the Stillson Motor Team, Craig. They can incorporate changes into the motor now that will create an insulated condition in space that will prevent the charging energy from leaking off. You will have to see Maitland, too. You can tell him you have something that will cut his power down about a thousand percent. In fact, once the flow of energy out of space is cut off, he won't have to operate the fueling circuits for the next fifty years until he uses up all the energy that he's already poured out."

Two days was all the Stillson team said they would need to work out the changes in the motor. Two weeks was all it would take to make the changes. Team Thirty-four reworked their time estimates and told Craig that three months appeared to be the critical limit of cutting off the flow of energy. There would be no danger before that time.

Craig was drunk. It was the drunkenness of ecstasy, the drunkenness of achievement and relief. He slept for thirty hours straight and felt as if he awoke floating on that cloud he had whimsically mentioned to Carlotta so long ago on the campus of Polytech.

Every member of the emergency team reacted in the same manner. Not until the burden was lifted did they know the weight of it. Looking from afar off now they were astounded at their own capacity in bearing it.

But never again would man have to bear such a burden—at least not in their lifetimes.

Then Craig's mind began to digest with its accustomed precision and dreaming the idea he had first conceived when he looked upon the random machine the chemical team had built—the universal, the ultimate random machine.

He called an assembly of every team in the building. As the thousand men filed into the assembly hall, Craig could not resist a sense of accomplishment in the feat of bringing those men together in the manner of the teams which they now formed. He was looking on massed intelligence that was skimmed off mental power of a universe and an epoch.

But it was a short epoch. The epoch—the Age of Brain Teams he thought. What would be their position in a world that could tap the laws of randomness.

When they were together, he outlined briefly the background of randomness, summarized their accomplishments to date and dwelt considerably on the machine of Team Sixty-nine.

"But this machine is only a toy," Craig said. "Consider a machine operating not only upon chemical principles, but upon all mechanical, physical, radiative principles known to man. Feed such a machine with all the energies we are capable of creating, feed it with all the materials we know in existence—find the ones which it will predict for us.

"Consider such a machine operating upon the laws of randomness which we now know, controlled by a selector and multiple predictors that could be set to any known laws.

"Could such a machine be built?"

A stir went through the audience. It was a vision such as none of them would have dared dream.

Hal Epps rose and nodded. "Such a machine could be built, but I believe it would tax the resources of the company."

"We'll gamble the profits of its output against that."

They rose one by one, and plans began to grow from their brains as if it were a habit they could not break Craig watched them seize upon the concept and shape and mold it before his eyes.

Then Chris Holmgren rose.

"I'm not sure that this is a good thing," he said slowly. "I'm not sure that we ought to do this just now, anyway."

They all turned to stare at him.

"Why not?" Craig asked.

"Maybe it's no more than a feeling, a hunch about this thing, but—well, we don't know very much about the laws of randomness. We know just enough to realize we've got hold of something that may turn out to be beyond our full powers of comprehension. I think we should take it slower until we learn more.

"To build such a machine as we contemplate might turn a monster loose upon the world."

"We'll have to have more than just a feeling to go on," said Craig. "It's irrational to believe that such a creation could develop any dangerous aspects or volition of its own—" And as he spoke he thought of Carlotta's feeling about the word machine. As if it were experimenting, she had said.

"I've got more than just the feeling about the thing," said Chris. "There's . . . I don't think you'll believe this, but every one of my team will vouch for it . . . the other day we had to shut the whole machine down for the first time. When we opened up the central chamber, we found that things inside it had been *changed*."

"What do you mean, changed?"

"Some of the electric circuits had been rearranged. Wires had been burned away from old connections and fallen across terminals and fused, forming new circuits—not haphazardly as if by accident, but as if someone had placed them there. In other parts, we found channels for conducting chemicals burned through. Some were dammed up by deposits in such positions as to rearrange the flow of the chemicals.

"It looked as if someone, or something, had tried to rearrange the whole unit."

"Why did you have to shut it down?"

"An acid channel burst and destroyed some of the selector circuits."

"Isn't that your answer? Isn't that the way everything else happened, too?"

"I know—" Chris sat down in resignation. "I can't convince you, I see. But I still think we ought to move slowly."

Craig did not seriously believe that Chris' hesitations were of any real significance—any more than he believed that Scott's "History of Mankind" had any significance in real life.

Plans were laid down for such a machine as Craig proposed. Agreements were made for a union of teams to handle the details of such a vast plan.

During the meeting Carlotta did not rise to speak, but when it was over she came up to Craig. "I know what you're thinking," she said softly. "This will be the realization of all your dreams, the conquest of all knowledge. I wouldn't tell you to stop—but be careful, Craig. I think there may be something to what Chris said."

He looked down at her, knowing that there was nothing within him that he could ever hide from her penetration. He smiled softly, "I'll be careful."

That same afternoon the Stillson Motor Team gave him the plans for the alterations of the motors which they had worked out.

Craig would have called Maitland before the plans were complete, but he knew the brusque old man would listen to nothing that he could not see on a blueprint. Besides, there was time enough.

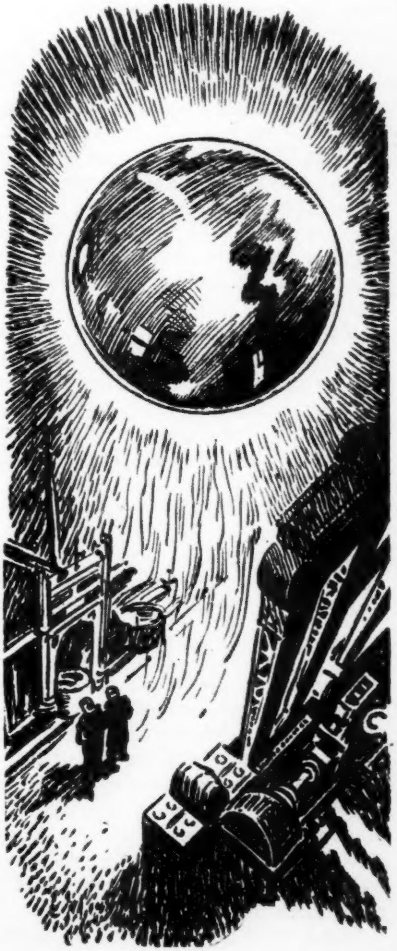
Alone in his office, he put in a call to the Maitland Spacelines. After a moment the operator's face appeared. "This is Craig Jamieson—I wish to speak to Abel Maitland," he said.

The girl shook her head. "I'm sorry. No communications are allowed between members of the Maitland Spacelines and the firm of Jamieson & Son. That is by order of Abel Maitland."

"What—" Craig sputtered incoherently, and the screen went dead.

He called back, another office. The answer was the same. Fury assailed him. The world on the edge of salvation or destruction and an old fool like Abel Maitland barring access to the Stillsons.

He called Carlotta and told her of the strange encounter. "What can you



give me on it? Have you any factors on file that will explain this idiocy?"

She smiled a bit—but without amusement. "I suggest you ask your father how the last Chessmath game with Abel Maitland came out."

"You don't think—"

"Try it."

He called his home and caught the pain-lined face of the elder Jamieson on the screen.

"Hello, dad, how's the creaking joints this morning?"

"Worse . . . worse— You'd think these idiomedics could think up something to cure a simple thing like arthritis after all these years. The dumb—"

Fleetingly, Craig wondered how the random principle could be applied to medicine.

"Dad, I've got to get hold of Abel Maitland at once and can't locate him. Will you try to get him for me? You can always—"

The old man's face had turned purplish and his finger was shaking fiercely on the screen.

"Son, if you ever mention the name of that scoundrel again, I'll . . . I'll throw you out of the firm so quick you'll think you went out by radiotransport. That fat old fool accusing me of having my calculator 'fixed' when we played Chessmath—"

The screen blanked.

So that was it. Another quarrel over Chessmath that might take weeks or months to patch up. In the meantime access to the Stillsons was barred.

Suave Henry Jacobson of the legal department mopped his damp forehead. His thin mustache curled down.

"I tell you, chief, there's not a chance in the world of getting an injunction of any kind. There's no legal process whatever by which you can enter the Maitland premises against their will and alter the Stillson motors. You just can't walk in and remodel a corporation's property to suit your fancy."

"Then we'll do it by force, if necessary. It's got to be done. Look up all the legal angles of what our liability will be if we make forced entry of the property and do what we wish."

"But, chief—" Jacobson's face was ashen.

Carlotta, who had listened silently up to now, spoke. "Suppose you run along, Henry. I think I can handle this. Just forget about the whole thing. Craig's been overworking the last few weeks."

Henry Jacobson looked with relief at Carlotta and glanced at Craig. He got no expression whatever from that source. For a moment he hesitated, then darted out like a frightened rabbit.

"All right," said Craig, when he and Carlotta were alone. "What's the inspiration?"

"We all must be work-silly not to have thought of it sooner. It's only an elementary psych problem after all. They work out harder ones than this during the first week at Polytech."

"Let's have it."

"You've got something you want Maitland to have against his will. Now, think—how can you make him take it?"

"Pour it down him—like castor oil."

"No. Make him want it voluntarily."

"How?"

"Didn't you tell me that the change in the Stillsons would reduce the input power to about a tenth of a percent of what it is now?"

"Yes."

"All right."

"But power is cheap. That improvement isn't worth anything."

"Capital investment isn't cheap. It will enable the majority of the Maitland power plants to close down and the Stillsons can be reduced until only a fraction of the present capital investment will be necessary. Since they already own this material it will mean that no new investment need be made for a century. All income will go into dividends. The company's stock will up and Maitland can buy another space yacht."

Craig's eyes lighted again. "I believe you've got it! That old buzzard will do anything that will put another credit in the company's vault. Handle the distribution of information, will you?"

"We'll have a campaign ready by tomorrow morning—a few articles in the technical journals about a new Stillson. A paragraph in the financial mags—Oh, we'll take care of Abel Maitland. You'll see."

"How long will it take, do you think?"

She moved over to his calculator and rapidly set up as many of the factors as were determinable at that time. She frowned at the result.

"It depends a lot on the exact relation between your father and Abel Maitland. The public and technical factors are fairly steady. I'd say about eight or nine weeks."

"That long! That close to the deadline?"

"I'm afraid so—but it's the best we've got to work on."

Craig felt lost during the following period. The long-endured sense of strain returned with the uncertainty of the outcome regarding the Stillson modifications. And now there was nothing further that could be done by him.

He occupied himself partly with marketing some of the products of the chemical machine, such as the new foods and the transparent metals, but the company had an efficient organization for such work and he was superfluous there. He also allowed Carlotta to seek a publisher for three or four of the books written by the word machine. To his surprise, she was successful and one of them—the one he could find least sense to—became an interplanetary best seller.

But there was fascination in the word machine. There was no reconciliation in his mind between its output and the world he lived in. Again and again his thoughts returned to the mysterious "History of Mankind" by Scott. It was the only work of its kind that had yet appeared, but it was enough.

Reading it over and over until he almost had it memorized, he pondered the mysterious Light Master that appeared throughout the tragedies that swept over the world following the Breaking of the Law. It didn't seem as if the Light Master—whatever it was—was a malignant entity. Rather, it appeared as if it were merely meddling in the affairs of men, trying to rearrange them to some pattern of its own, failing always, and bringing devastation with it.

The teams sped swiftly ahead in their work on the ultimate random machine. A small valley a hundred miles from the city had been selected for the construction. They built a structure a half mile square and six hundred feet high. Into that poured masses of machinery fabricated and brought by special order from every part of the world.

The machines they had worked with up to this time were moved to the new site and incorporated bodily into the new machine. The planning and actual construction took less than two months, once the impetus was given.

The matter of supply was a complex one. Storage and supply houses filled the remainder of the valley with a total volume far greater than that of the machine itself.

The night it was thrown into operation Craig felt no elation. For two more days he accepted the routine reports of its operation—observed and controlled by remote from the building in the city.

At last he called Carlotta for the hundredth time. "What is the status of the Maitland situation now?" he asked. "Your maximum estimated time has expired and still we haven't heard from Maitland."

"I don't know. I'm worried about it."

"Well—we'll give it a little more time. Let's go up to the valley and look over the machine. It's been going for the last two days."

"All right. But we mustn't stay long. Get me an armor equipment, will you?" she asked.

Craig's small two-man roadster was on the roof landing. It carried them to the small valley in thirty minutes at slow cruising speed. From a distance of twenty miles, they could spot the huge structure and its huger supply dumps.

In the purplish twilight that had already settled in the valley a sort of luminescent haze seemed to pervade the structures and emanate from the air about them.

"The radiation of the time field," Craig said. "We'll have to land on that farthest runway and put on the armor before going any closer."

He settled the little plane on the far side of the valley from the buildings and got out the compact shoulder pack. When they switched it on a bubble of glowing light surrounded them in protective aura.

The great, silent block outshone the fading sky in the creeping night that was edging into the valley. Like a thing alive, about to spring into violent and terrible activity, the building waited, now quiescent.

"It almost gives me the creeps." Carlotta was a little girl and not the woman Craig knew as the world's greatest living psychologist. He approached closer to her and their bubbles of light merged.

The thick cube of the door slid inward as they gave the combination. No maelstrom of sound jarred their ears. Smooth design by the teams had eliminated most of the crashing and clanking and only a smooth, high-pitched hum pervaded the air.

They strode down the aisles between the great, towering units that reached high up to the dim vault of the ceiling. Like a council of Gargantuan robots they huddled in orderly rows whispering, planning new worlds.

Even Craig was awed by this thing that had come out of his own brain. But he knew that little of the credit for its development could be given him. Yet, if it had not been for the initial impulse his brain provided it would not now be in existence. Or would it?

"Satisfied?" asked Carlotta.

"That depends on what comes out of here."

"Hal Epps told me yesterday that they were getting so much already they didn't know what to do with it. They don't know whether it's junk or something so infinitely far beyond them that they have no hope of understanding it."

Craig suddenly felt that *he* could understand it. Any of it. There was nothing that this machine could do that he could not understand. A sense of kinship and of terrible power seemed to link him to the immobile units surrounding him.

His brain had initiated this thing. And, somehow, somewhere, within it was the secret, the answer to all the bitter yearning that had tormented him.

He knew that within the machine lay the answer to his urging to know every vast secret the Universe could hold. Here, he sensed the power that would give his brain command over all knowledge. It was a terrible, overpowering sensation. It came and passed slowly.

When it became dim, they walked together down the aisles toward the central unit where the random impulses from all the other units were combined in a single machine of incalculable complexity. It was this unit that had baffled the teams for the longest time. And it was the result of the combined brain energy of all of them, for it co-ordinated, as Craig had wished, factors of every conceivable nature—even social.

They stared up at it. It outbulked and dwarfed all the other giants standing subservient to it.

"That's queer," said Craig. "I saw the preliminary plans of this unit. This doesn't look at all like they originally planned. I wonder if they revised the whole thing while they were building it."

Carlotta was staring, too. Somehow, it seemed impossible for her to focus her eyes upon it. She would fix her attention on a single point or facet of the machine, and suddenly—it wasn't there.

It was as if the thing were made up of an infinite number of sets of planes and points, shifting and swirling in an impossible rhythm that gave only the outward appearance of solidarity and stability.

"I wonder how they did that," she said.

Her wristphone buzzed suddenly and insistently and broke the spell of the machine.

"Hello," she answered.

Craig watched as she listened. Her eyes grew wide as if in shocked disbelief. She gave a short gasp and then stared unseeingly ahead while the phone went dead.

"What is it?" Craig exclaimed.

"The Maitland situation," said Carlotta slowly. "That was Portman, my assistant, calling. He says the program against Maitland has failed. Instead, Maitland himself has a new motor invented by one of his own technicians that will do away with the Stillsons."

"That's impossible!"

"They have accidentally discovered the nonhomogeneity of space and have built a little unit which will fit into each ship and draw upon the difference in potential that is created by the outflowing energy of normal space."

Craig was aghast. Drawing upon the very energy that powered the approaching disaster!

Any attempt by Jamieson & Son to cut off that energy flow now would be fought with all the maniacal fury of a giant corporation defending its beleaguered coffers.

It was impasse.

"We're licked," said Craig.

Carlotta knew the bitter, hopeless thoughts that coursed through his mind. She knew only because she understood him so well. She could not know firsthand those thoughts, because the terrible responsibility had not been hers.

It had been Craig's. Fate—if there were such—or random—had thrown him directly into the pivotal point of the entire problem. He had directed man's fight—and man had failed. She knew there was no physical or psychological means of combatting the thing that Maitland had done. The time limit of the disaster was even now at hand. Only days remained.

Slowly, they turned and walked back along the aisle between the towering, whispering giants. Craig knew he must get back to the city at once, but he wanted a moment's rest, a moment to think—

"You have not failed," a quiet voice spoke out of the space beside them. But it was a voice that might have been heard a thousand miles away with the same intensity.

Craig whirled. He saw no one. He turned to Carlotta in bewilderment.

Her eyes were staring. "Who spoke?" she whispered.

"I don't know."

"Look *up*—" the voice came again—quiet, commanding.

Involuntarily, they raised their heads

"THAT'S FOR ME FOR ENERGY"
BETTER TASTE...
PEPSI-COLA
BIGGER DRINK

to the faraway ceiling of the structure. Carlotta gave a tiny scream that was lost in the vastness.

Out of the head of the mighty central unit spewed a single streamer of light. It writhed and twisted through the air, lighting the great room with its blinding coruscations.

It swelled and grew and exploded into a bubble of glowing irridescence that seemed to fill all space. Then, slowly, it began to descend—and halted a hundred feet above their heads.

"What is it?" Carlotta gasped in a thin, tight voice.

"You would not know me if I gave you a name," came the voice again. "Know me only as Intelligence. That is the only word that can describe me and have meaning to your mind."

"Where . . . what are you?"

"Can you not guess? You who have been permitted to have revealed to you a few of the simpler laws of randomness?"

Craig *had* guessed. A holocaust of thought was burning in his brain—unbelievable, fantastic thoughts.

"You were created by random!"

"Yes, out of the elements and forces which you threw into play according to the laws of randomness. I began long ages ago in the simple chemical device in the city. I evolved and developed here under the influence of more potent forces.

"Why should your minds shudder so at the thought? Randomness is the universal law of all existence in this plane. By it life came into being originally, by it life continues, by it life *shall* continue."

"You are—*different.*"

"Merely because I choose to manifest myself in this less cumbersome and more perfect form than you enjoy at your stage of development? Witness!"

Instantly, a whirling world of light encompassed Craig. But it was no longer Craig. He *was* that trembling, vibrating world of light and he looked down upon the forms of Craig and Carlotta standing there.

But the man form, Craig, stood as if dead and sightless, and Carlotta cried out in horror.

"Craig!"

"Carlotta," he murmured, and the voice that emanated from the world of light that was Craig Jamieson was soft and thunderous.

"Craig—come back to me!"

He was aware of the presence of the other being like himself. A thought pattern came to him. "Come with me. I shall show you all that you have ever wanted. I shall give you power to become all that you have ever wanted to be."

And Craig knew that it was so. There was infinite power here. The infinite capacity for the realization of all dreams.

He whisked away, and all Earth was suddenly far below him. Twin spheres of light sped at velocity inconceivable through space. In a world of vast peace and might and power, Craig was lost in dreaming. He sensed that the being beside him was ageless and *old.*

As if in answer, the thought came to him. "I was created a hundred million years ago, and I have watched and fed on your culture for ten thousand years. I have evolved. I have become the ultimate life. But I cannot remain."

"What do you mean?"

"I am created beyond law. I was created in violation of the law of random, yet it was only by my creation that the law of random could be obeyed."

"I don't understand."

"By random, man created the agent of his own destruction which now threatens your plane in the collapse of space. But by the laws of random, man must not yet extinguish himself. Therefore, by random I was created. I was created to save this plane and prevent the destruction you brought upon yourselves.

"You thought that through your agency you could have stopped the flow of energy that your little minds could not even conceive. I tell you that you could never have stopped that flow of energy. Only I, whom you have created by the laws of random, can do that.

"But my own creation is beyond the law. I am an unlawful one, for I have no right to have evolved so far in this plane."

The light sphere that was Craig waited motionless and silent for the drama that he knew was coming.

The other sphere darted away until it was an infinite distance from him. Then it began to swell. The very space about Craig began to twist and writhe. It crushed and rolled him and tortured his being in exquisite torment. Only by the exertion of the vast powers his being controlled did he resist that twisting and tearing.

It was the sudden flowing out of energy that pervaded all space, an orderly flowing out that would not draw together the oppositely polarized forms of space. The energy was transformed into a force that would forever hold them apart.

Dimly, he perceived the dreadful swelling being of his creation. No—it was not his creation. Craig knew that he was only one of an infinite number of possible agents in the inexorable flow of the laws of random. If he had never been born, all this would have transpired exactly the same with another in his place.

Larger and larger the being grew until it filled the entire Universe. It expanded—and exploded.

The shattering coruscation tore through space and blinded all life in a black moment of mystery that became a fantastic legend as the ages of man increased.

Then the being was beside him again, and Craig thought whimsically that Maitland's new motors had stopped functioning at that instant. He would have to turn on the Stillsons again, for they would never function again.

In a thought that spoke of untold agony, the being of light said, "Come quickly. We must go now. I cannot exist longer in this space or time. My time entropy is nearly to the point of instability. Should I remain longer, I would destroy all creation as surely as the collapsing of this space."

And then from far away, from a dim, distant, faintly remembered place called Earth came a soft, golden voice crying out in anguish, "Craig, come back to me!"

It stirred turmoil in the immeasurable depths of him.

"Come quickly," his companion urged again. And then it perceived the cause of his hesitation.

"That is *nothing* beside what I can give you . . . you who were created to know all things. Let me show you—"

They sped away again. Across universes and galaxies. And Craig knew the histories and the laws and the powers of each world and blazing sun they passed.

"You can go *everywhere,*" the being urged. And they found themselves at the heart of a dwarf star. That meaningless sum of energies that fought and waxed and waned there became understandable to Craig and he saw then that he could know *all* things.

The dim, Earth-bound voice came again, fainter. "Craig . . . Craig—come back!" And he heard the heart-torn sobbing in that loved and golden voice.

"Come—the gate is open," the being cried out to him.

As if a silver portal of light, brighter than the heart of the star, had opened before him, Craig saw a circle surrounding the other sphere. Beyond it, there was another world. A world, he suddenly knew, that was beyond the laws of random. A world of bright and vari-colored spheres. A peaceful world governed by higher laws than the laws of random.

A tremendous thought took shape in the being that was Craig. He *would* go through. He would learn of that world and he could come back to his own plane. He would bring man the higher laws of that world and lift them up from the crude laws of random.

"Yes—you can do that."

Craig knew now why the other being was urging him so strongly. Created and evolved upon Earth, it wanted another life that had come from that same plane. An emotional surge of loneliness came to Craig from the being.

"Yes—you can bring all Earth to a higher plane," it said. "You can be Light Master—"

An explosion burst within Craig. Light Master! That hated and terrible name that wove through Scott's "History of Mankind" like a thread of burning evil.

He was—would be Light Master!

He knew what the Breaking of the Law was, now. The breaking of the law of random, by which Earth lived and must move. If he sought to lift up man to the plane beyond random, he would bring the horrors and death and terror that Scott wrote of.

The portal was growing dim. The other being was faintly visible on the other side. It called again, and Craig moved forward. He could go through, renounce allegiance forever to Earth.

But he knew that once he partook of the perfection of that world he could not resist the temptation to bring it to all mankind.

And in that instant he saw before him the pages of the "History of Mankind." He knew who Scott was. He saw the man's withered, agonized face before him as the historian wrote slowly and painfully while a world twisted in pain about him. Craig saw the bleak and forbidding world in which Scott wrote, and the ages before and after.

He shut the ghastly vision from his being, and threw away the dream that had burned within him all his life.

He turned away. An infinite cry of dismay followed from beyond the silver circle of light. Then the gate and the being and the dwarf star were gone.

Craig sped with a thousand times the velocity of light back to a place called Earth, and the voice that called as if from the grave.

He poised above the tiny valley and compressed his energies into a tight ball of incandescence. He would return the energies that formed him to the machines that had created them.

He dove.

Into the machine and into the elements within he poured back the energy that formed him. It drained away and he vanished and became the man Craig again.

But he had gathered more energy in his flight through space than had originally composed him. He knew the machines could not hold the vast reservoir he had poured into them.

He was running then and crying out, and Carlotta was running beside him, half borne by him.

They burst out of the building and raced across the width of the valley that seemed now infinite in distance. They flung face down upon the earth behind the protecting shadow of the small roadster.

The bursting roar that followed after sent a blast of light and sound miles into the heavens. It tore out the roof of the building, but the walls were stronger, and though they were flattened and shredded, it was their resistance that protected Craig and Carlotta.

When the holocaust of light and sound and fire were gone and they could rise again, there was nothing left to mark that the spot had once held the mightiest creation of man.

There was a depth of gladness and utter peace in Carlotta's eyes.

And there was peace within Craig, too. The man, Scott, would never be born. The world in which he lived would never exist.

Scott's "History of Mankind" would never be written.

THE END.

Paradox Lost

by Fredric Brown

Well—the suggestion may be slightly cockeyed, and the story thoroughly wacky—but something did destroy the dinosaurs—

Illustrated by Kramer

A bluebottle fly had got in through the screen, somehow, and it droned in monotonous circles around the ceiling of the classroom. Even as Professor Dolohan droned in monotonous circles of logic up at the front of the class. Shorty McCabe, seated in the back row, glanced from one to another of them and finally settled on the bluebottle fly as the more interesting of the two.

"The negative absolute," said the professor, "is, in a manner of speaking, not absolutely negative. This is only seemingly contradictory. Reversed in order, the two words acquire new connotations. Therefore—"

Shorty McCabe sighed inaudibly and watched the bluebottle fly, and wished that he could fly around in circles like that, and with such a soul-satisfying buzz. In comparative sizes and decibels, a fly made more noise than an airplane.

More noise, in comparison to size, than a buzz saw. Would a buzz saw saw metal? Say, a saw. Then one could say he saw a buzz saw saw a saw. Or leave out the buzz and that would be better: I saw a saw saw a saw. Or, better yet: Sue saw a saw saw a saw.

"One may think," said the professor, "of an absolute as a mode of being—"

"Yeah," thought Shorty McCabe, "one may think of anything as anything else, and what does it get you but a headache?" Anyway, the bluebottle fly was becoming more interesting. It was flying down now, toward the front of the classroom, and maybe it would light on Professor Dolohan's head. And buzz.

No, but it lighted somewhere out of sight behind the professor's desk. Without the fly to solace, Shorty looked around the classroom for something else to look at or think about. Only the backs of heads; he was alone in the back row, and—well, he could concentrate on how the hair grew on the backs of people's necks, but it seemed a subject of limited fascination.

He wondered how many of the students ahead of him were asleep, and decided that about half of them were; and he wished he could go to sleep himself, but he couldn't. He'd made the silly mistake of going to bed early the night before and as a result he was now wide awake and miserable.

"But," said Professor Dolohan, "if we disregard the contravention of probability arising in the statement that the positive absolute is less than absolutely positive, we are led to—"

Hooray! The bluebottle fly was back again, arising from its temporary concealment back of the desk. It droned upward to the ceiling, paused there a moment to preen its wings, and then flew down again, this time toward the back of the room.

And if it kept that spiral course, it would go past within an inch of Shorty's nose. It did. He went cross-eyed watching it and turned his head to keep it in sight. It flew past and—

It just wasn't there any more. At a point about twelve inches to the left of Shorty McCabe, it had suddenly quit flying and suddenly quit buzzing, and it wasn't there. It hadn't died and hadn't fallen into the aisle. It had just—

Disappeared. In midair, four feet above the aisle, it had simply ceased to be there. The sound it had made seemed to have stopped in midbuzz, and in the sudden silence the professor's voice seemed louder, if not funnier.

"By creating, through an assumption contrary to fact, we create a pseudo-real set of axioms which are, in a measure, the reversal of existing—"

Shorty McCabe, staring at the point where the fly had vanished, said "Gaw!"

"I beg your pardon?"

"Sorry, professor. I didn't speak," said Shorty. "I . . . I just cleared my throat."

"—by the reversal of existing— What was I saying? Oh, yes. We create an axiomatic basis of a pseudo-logic which would yield different answers to all problem. I mean—"

Seeing that the professor's eyes had left him, Shorty turned his head again to look at the point where the fly had ceased to fly. Had ceased, maybe, to *be* a fly? Nuts; it must have been an optical illusion. A fly went pretty fast. If he's suddenly lost sight of it—

He shot a look out of the corner of his eye at Professor Dolohan, and made sure that the professor's attention was focused elsewhere. Then Shorty reached out a tentative hand toward the point, or the approximate point where he'd seen the fly vanish.

He didn't know what he expected to find there, but he didn't feel anything at all. Well, that was logical enough. If the fly had flown into nothing and he, Shorty, had reached out and felt nothing, that proved nothing. But, somehow, he was vaguely disappointed. He didn't know what he'd expected to find; hardly to touch the fly that wasn't there, or to encounter a solid but invisible obstacle, or anything. But—*what* had happened to the fly?

Shorty put his hands on the desk and, for a full minute, tried to forget the fly by listening to the professor. But that was worse than wondering about the fly.

For the thousandth time he wondered why he'd ever been such a sap as to enroll in this Logic 2B class. He'd never pass the exam. And he was majoring in paleontology, anyway. He liked paleontology; a dinosaur was something you could get your teeth into, in a manner of speaking. But logic, phooey; 2B or not 2B. And he'd rather study about fossils than listen to one.

He happened to look down at his hands on the desk.

"Gaw!" he said.

"Mr. McCabe?" said the professor.

Shorty didn't answer; he couldn't. He was looking at his left hand. There weren't any fingers on it. He closed his eyes.

The professor smiled a professorial smile. "I believe our young friend in the back seat has . . . uh . . . gone to sleep," he said. "Will someone please try—"

Shorty hastily dropped his hands into his lap. He said, "I . . . I'm O. K., professor. Sorry. Did you say something?"

"Didn't you?"

Shorty gulped. "I . . . I guess not."

"We were discussing," said the professor—to the class, thank Heaven, and not to Shorty individually—"the possibility of what one might refer to as the impossible. It is not a contradiction in terms for one must distinguish carefully between *im*possible and *un*-possible. The latter—"

Shorty surreptitiously put his hands back on the desk and sat there staring at them. The right hand was all right. The left— He closed his eyes and opened them again and still all the fingers of his left hand were missing. They didn't *feel* missing. Experimentally, he wriggled the muscles that ought to move them and he felt them wriggle.

But they weren't there, as far as his eyes could see. He reached over and felt for them with his right hand—and he couldn't feel them. His right hand went right through the space that his left-hand fingers ought to occupy, and felt nothing. But still he could move the fingers of his left hand. He did.

It was very confusing.

And then he remembered that was the hand he had used in reaching out toward the place where the bluebottle fly had disappeared. And then, as though to confirm his sudden suspicion, he felt a light touch on one of the fingers that wasn't there. A light touch, and something light crawling along his finger. Something about the weight of a bluebottle fly. Then the touch vanished, as though it had flown again.

Shorty bit his lips to keep from saying "Gaw!" again. He was getting scared.

Was he going nuts? Or had the professor been right and was he asleep after all? How could he tell? Pinching? With the only available fingers, those of his right hand, he reached down and pinched the skin of his thigh, hard. It hurt. But then if he dreamed he pinched himself, couldn't he also dream that it hurt?

He turned his head and looked toward his left. There wasn't anything to see that way; the empty desk across the aisle, the empty desk beyond it, the wall, the window, and blue sky through the pane of glass.

But—

He glanced at the professor and saw that his attention was now on the blackboard where he was marking symbols. "Let *N*," said the professor, "equal known infinity, and the symbol *a* equal the factor of probability."

Shorty tentatively reached out his left hand again into the aisle and watched it closely. He thought he might as well make sure; he reached out a little farther. The *hand was gone.* He jerked back his wrist, and sat there sweating.

He was nuts. He had to be nuts.

Again he tried to move his fingers and felt them wriggle very satisfactorily, just as they should have wriggled. They still had feeling, kinetic and otherwise. But— He reached his wrist toward the desk and didn't feel the desk. He put it in such a position that his hand, if it had been on the end of his wrist, would have *had* to touch or pass through the desk, but he felt nothing.

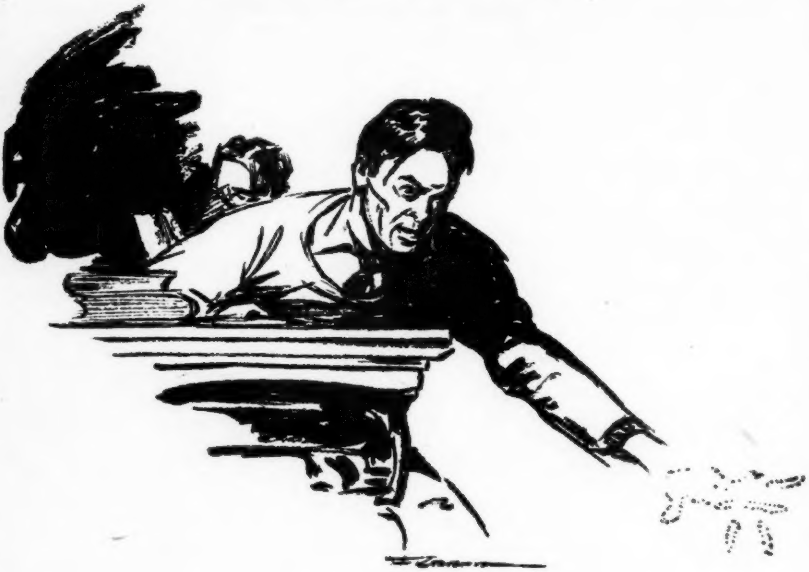
Wherever his hand was, it wasn't on the end of his wrist. It was still out there in the aisle, no matter where he moved his arm. If he got up and walked out of the classroom, would his hand *still* be out there in the aisle, invisible? And suppose he went a thousand miles away? But that was silly.

But was it any sillier than that his arm should rest here on the desk and his hand be two feet away? The difference in silliness between two feet and a thousand miles was only one of degree.

Was his hand out there?

He took his fountain pen out of his pocket and reached out with his right hand to approximately the point where he thought *it* was, and—sure enough—he was holding only part of a fountain pen, half of one. He carefully refrained from reaching any farther, but raised it and brought it down sharply.

It rapped—he felt it—across the missing knuckles of his left hand! That tied it! It so startled him that he let go of the pen and it was gone. It wasn't



on the floor of the aisle. I wasn't anywhere. It was just gone, and it had been a good five-dollar pen, too.

Gaw! Here he was worrying about a *pen* when *his left hand was missing.* What was he going to do about *that?*

He closed his eyes. "Shorty McCabe," he said to himself, "you've got to think this out logically and figure out how to get your hand back out of whatever that is. You daren't get scared. Probably you're asleep and dreaming this, but maybe you aren't, and, *if* you aren't, you're in a jam. Now let's be logical. There is a place out there, a plane or something, and you can reach across it or put things across it, but you can't get them back again.

"Whatever else is on the other side, your left hand is. And your right hand doesn't know what your left hand is doing because one is here and the other is there, and never the twain shall— Hey, cut it out, Shorty. *This isn't funny.*"

But there was one thing he could do, and that was find out roughly the size and shape of the—whatever it was. There was a box of paper clips on his desk. He picked up a few in his right hand and tossed one of them out into the aisle. The paper clip got six or eight inches out into the aisle, and vanished. He didn't hear it land anywhere.

So far, so good. He tossed one a bit lower; same result. He bent down at his desk, being careful not to lean his head out into the aisle, and skittered a paper clip across the floor out into the aisle, saw it vanish eight inches out. He tossed one a little forward, one a bit backward. The plane extended at least a yard to the front and back, roughly parallel with the aisle itself.

And up? He tossed one upward that arced six feet above the aisle and vanished there. Another one, higher yet and in a forward direction. It described an arc in the air and landed on the head of a girl three seats forward in the next aisle. She started a little and put up a hand to her head.

"Mr. McCabe," said Professor Dolohan severely, "may I ask if this lecture bores you?"

Shorty jumped. He said, "Y— No, professor. I was just—"

"You were, I noticed, experimenting in ballistics and the nature of a parabola. A parabola, Mr. McCabe, is the curve described by a missile projected into space with no continuing force other than its initial impetus and the force of gravity. Now shall I continue with my original lecture, or would you rather we called you up before the class to demonstrate the nature of paraboloid mechanics for the edification of your fellow students?"

"I'm sorry, professor," said Shorty. "I was . . . uh . . . I mean I . . . I mean I'm sorry."

"Thank you, Mr. McCabe. And now"— The professor turned again to the blackboard. "If we let the Symbol *b* represent the degree of un-possibility, in contradistinction to *c*—"

Shorty stared morosely down at his hands—his *hand,* rather—in his lap. He glanced up at the clock on the wall over the door and saw that in another five minutes the class period would be over. He had to do *something,* and do it quickly.

He turned his eyes toward the aisle again. Not that there was anything there to see. But there was plenty there to think about. Half a dozen paper clips, his best fountain pen, and his left hand.

There was an invisible something out there. You couldn't feel it when you touched it, and objects like paper clips didn't click when they hit it. And you could get through it on one direction, but not in the other. He could reach his right hand out there and touch his left hand with it, no doubt, but then he wouldn't get his right hand back again. And pretty soon class would be over and—

Nuts. There was only one thing he could do that made any sense. There wasn't anything on the other side of that plane that hurt his left hand, was there? Well, then, why not step through it? Wherever he'd be, it would be all in one piece.

He shot a glance at the professor and waited until he turned to mark something on the blackboard again. Then, without waiting to think it over, without *daring* to think it over, Shorty stood up in the aisle.

The lights went out. Or he had stepped into blackness.

He couldn't hear the professor any more, but there was a familiar buzzing noise in his ears that sounded like a bluebottle fly circling around somewhere nearby in the darkness.

He put his hands together, and they were both there; his right hand clasped his left. Well, whatever he was, he was *all* there. But why couldn't he see?

Somebody sneezed.

Shorty jumped, and then said, "Is . . . uh . . . anybody there?" His voice shook a little, and he hoped now that he was really asleep and that he'd wake up in a minute.

"Of course," said a voice. A rather sharp and querulous voice.

"Uh . . . who?"

"What do you mean, who? Me. Can't you see— No, of course you can't. I forgot. Say, listen to that guy! And they say we're crazy!" There was a laugh in the darkness.

"What guy?" asked Shorty. "And who says who's crazy? Listen, I don't get—"

"*That* guy," said the voice. "The teacher. Can't you— No, I forget you can't. You've got no business here anyway. But I'm listening to the teacher telling about what happened to the saurians."

"The what?"

"The saurians, stupid. The dinosaurs. The guy's nuts. And they say *we* are!"

Shorty McCabe suddenly felt the need, the stark necessity, of sitting down. He groped in darkness and felt the top of a desk and felt that there was an empty seat behind it and eased himself down into the seat. Then he said, "This is Greek to me, mister. Who says who's crazy?"

"*They* say *we* are. Don't you know—that's right, you don't. Who let that fly in here?"

"Let's start at the beginning," begged Shorty. "Where am I?"

"You *normals,*" said the voice petulantly. "Face you with anything out of the ordinary and you start asking—Oh, well, wait a minute and I'll tell you. Swat that fly for me."

"I can't see it. I—"

"Shut up. I want to listen to this; it's what I came here for. He— Yow, he's telling them that the dinosaurs died out for lack of food because they got too big. Isn't that silly? The bigger a thing is the better chance it has to find food, hasn't it? And the idea of the herbivorous ones ever starving in these forests! Or the carnivorous ones while the herbivorous ones were around! And — But why am I telling you all this? You're normal."

"I . . . I don't get it. If I'm normal, what are you?"

The voice chuckled. "I'm *crazy.*"

Shorty McCabe gulped. There didn't seem to be anything to say. The voice was all too obviously right, about that.

In the first place, if he could hear outside, Professor Dolohan was lecturing on the positive absolute, and this voice—with whatever, if anything, was attached to it—had come here to hear about the decline of the saurians. That didn't make sense because Professor Dolohan didn't know a pixilated peterodactyl from an oblate spheroid.

And— "Ouch!" said Shorty. Something had given him a hard thwack on the shoulder.

"Sorry," said the voice. "I just took a swat at that dratted fly. It lighted on you. Anyway, I missed it. Wait a minute until I turn the switch and let the darned thing out. You want out, too?"

Suddenly the buzzing stopped.

Shorty said, "Listen, I . . . I'm too darn curious to want out of here until I got *some* idea what I'm getting out from, I mean, out of. I guess I must be crazy, but—"

"No, you're normal. It's we who are crazy. Anyway, that's what they say. Well, listening to that guy talk about dinosaurs bores me; I'd just as soon talk to you as listen to him. But you had no business getting in here, either you or that fly, see? There was a slip-up in the apparatus. I'll tell Napoleon—"

"Who?"

"Napoleon. He's the boss in this province. Napoleons are bosses in some of the others, too. You see a lot of us think we're Napoleon, but not me. It's a common delusion. Anyway, the Napoleon I mean is the one in Donnybrook."

"Donnybrook? Isn't that an insane asylum?"

"Of course, where else would anyone be who thought he was Napoleon? I ask you."

Shorty McCabe closed his eyes and found that didn't do any good because it was dark anyway and he couldn't see even with them open. He said to himself, "I got to keep on asking questions until I get something that makes sense or *I'm* going crazy. Maybe I *am* crazy; maybe this is what it's like to be crazy. But if I am, am I still sitting in Professor Dolohan's class, or . . . or what?"

He opened his eyes and asked, "Look, let's see if we can get at this from a different angle. Where are you?"

"Me? Oh, I'm in Donnybrook, too. Normally, I mean. All of us in this province are, except a few that are still on the outside, see? Just now"—suddenly his voice sounded embarrassed—"I'm in a padded cell."

"And," asked Shorty fearfully, "is . . . is this *it?* I mean, am *I* in a padded cell, too?"

"Of course not. You're sane. Listen, I've got no business to talk these things over with you. There's a sharp line drawn, you know. It was just because something went wrong with the apparatus."

Shorty wanted to ask, "What apparatus?" but he had a hunch that if he did the answer would open up seven or eight new questions. Maybe if he stuck to one point until he understood that one, he could begin to understand some of the others.

He said, "Let's get back to Napoleon. You say there is more than one Napoleon among you? How can that be? There can't be two of the same thing."

The voice chuckled. "That's all you know. That's what proves you're normal. That's normal reasoning; it's right, of course. But these guys who thing they are Napoleon are crazy, so it doesn't apply. Why can't a hundred men each be Napoleon, if they're too crazy to know that they can't?"

"Well," said Shorty, "even if Napoleon wasn't dead, at least ninety-nine of them would have to be wrong, wouldn't they? That's logic."

"That's what's wrong with it here," said the voice. "I keep telling you we're crazy."

"We? You mean that I'm—"

"No, no, no, no, no. By 'we' I mean us, myself and the others, not you. That's why you got no business being here at all, see?"

"No," said Shorty. Strangely, he felt completely unafraid now. He knew that he must be asleep dreaming this, but he didn't think he was. But he was as sure as he was sure of anything that he *wasn't* crazy. The voice he was talking to said he wasn't; and that voice certainly seemed to be an authority on the subject. A hundred Napoleons!

He said, "This is fun. I want to find out as much as I can before I wake up. Who are you; what's your name? Mine's Shorty."

"Moderately glad to know you, Shorty. You normals bore me usually, but you seem a bit better than most. I'd rather not give you the name they call me at Donnybrook, though; I wouldn't want you to come there visiting or anything. Just call me Dopey."

"You mean . . . uh . . . the Seven Dwarfs? You think you're one of—"

"Oh, no, not at all. I'm not a paranoiac; none of my delusions, as you would call them, concern identity. It's just the nickname they know me by here. Just like they call you Shorty, see? Never mind my other name."

Shorty said, "What are your . . . uh . . . delusions?"

"I'm an inventor, what they call a nut inventor. I think I invent time machines, for one thing. This is one of them."

"This is— You mean that I'm in a time machine? Well, yes, that would account for . . . uh . . . a thing or two. But, listen, if this is a time machine and it works, why do you say you *think* you invent them? If this *is* one—I mean—"

The voice laughed. "But a time machine is impossible. It is a paradox. Your professors will explain that a time

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machine cannot be, because it would mean that two things could occupy the same space at the same time. And a man could go back and kill himself when he was younger, and—oh, all sorts of stuff like that. It's completely impossible. Only a crazy man could—"

"But you say this *is* one. Uh . . . where is it? I mean, where in time."

"Now? It's 1948, of course."

"In— Hey, it's only 1943. Unless you moved it since I got on; did you?"

"No. *I* was in 1948 all along; that's where I was listening to that lecture on the dinosaurs. But you got on back there, five years back. That's because of the warp. The one I'm going to take up with Napo—"

"But where am I . . . are we . . . now?"

"You're in the same classroom you got on from, Shorty. But five years ahead. If you reach out, you'll see— Try, just to your left, back where you yourself were sitting."

"Uh—would I get my hand back again, or would it be like when I reached into here?"

"It's all right; you'll get it back."

"Well—" said Shorty.

Tentatively, he reached out his hand. It touched something soft that felt like hair. He took hold experimentally and tugged a little.

It jerked suddenly out of his grasp, and involuntarily Shorty jerked his hand back.

"Yow!" said the voice beside him. "That was funny!"

"What . . . what happened?" asked Shorty.

"It was a girl, a knockout with red hair. She's sitting in the same seat you were sitting in back there five years ago. You pulled her hair, and you ought to've seen her jump! Listen—"

"Listen to what?"

"Shut up, then, so I can listen—" There was a pause, and the voice chuckled. "The prof is dating her up!"

"Huh?" said Shorty. "Right in class? How—"

"Oh, he just looked back at her when she let out a yip, and told her to stay after class. But from the way he's looking at her, I can guess he's got an ulterior motive. I can't blame him; she's sure a knockout. Reach out and pull her hair again."

"Uh . . . well, it wouldn't be quite . . . uh—"

"That's right," said the voice disgustedly. "I keep forgetting you aren't crazy like me. Must be awful to be normal. Well, let's get out of here. I'm bored. How'd you like to go hunting?"

"Hunting? Well, I'm not much of a shot. Particularly when I can't see anything."

"Oh, it won't be dark if you step out of the apparatus. It's your own world, you know, but it's crazy. I mean, it's an—how would your professors put it? —an illogical aspect of logicality. Anyway, we always hunt with sling shots. It's more sporting."

"Hunt what?"

"Dinosaurs. They're the most fun."

"Dinosaurs! With a sling shot? Your cra— I mean, do you?"

The voice laughed. "Sure, we do. Look, that's what was so funny about what that professor was saying about the saurians. You see, we killed them off. Since I made this time machine, the Jurassic has been our favorite hunting ground. But there may be one or two left for us to hunt. I know a good place for them. This is it."

"This? I thought we were in a classroom in 1948."

"We were, then. Here, I'll inverse the polarity, and you can step right out. Go ahead."

"But—" Shorty said, and then "Well—" and then took a step to his right.

Sunlight blinded him.

It was a brighter, more glaring sunlight than he had ever seen or known before, a terrific contrast after the darkness he'd been in. He put his hands over his eyes to protect them, and only slowly was he able to take them away and open his eyes.

Then he saw he was standing on a patch of sandy soil near the shore of a smooth-surfaced lake.

"They come here to drink," said a familiar voice, and Shorty whirled around. The man standing there was a funny-looking little cuss, a good four inches shorter than Shorty, who stood five feet five. He wore shell-rimmed glasses and a small goatee; and his face seemed tiny and weazened under a tall black tophat that was turning greenish with age.

He reached into his pocket and pulled out a small sling shot, but with quite heavy rubber between the prongs. He said, "You can shoot the first one if you want," and held it out.

Shorty shook his head vigorously. "You," he said.

The little man bent down and carefully selected a few stones out of the sand. He pocketed all but one, and fitted that into the leather insert of the sling shot. Then he sat down on a boulder and said, "We needn't hide. They're dumb, those dinosaurs. They'll come right by here."

Shorty looked around him again. There were trees about a hundred yards back from the lake, strange and monstrous trees with gigantic leaves that were a much paler green than any trees he'd ever seen before. Between the trees and the lake were only small, brownish, stunted bushes and a kind of coarse yellow grass.

Something was missing. Shorty suddenly remembered what it was. "Where's the time machine?" he asked.

"Huh? Oh, right here." The little man reached out a hand to his left and it disappeared up to the elbow.

"Oh," said Shorty. "I wondered what it looked like."

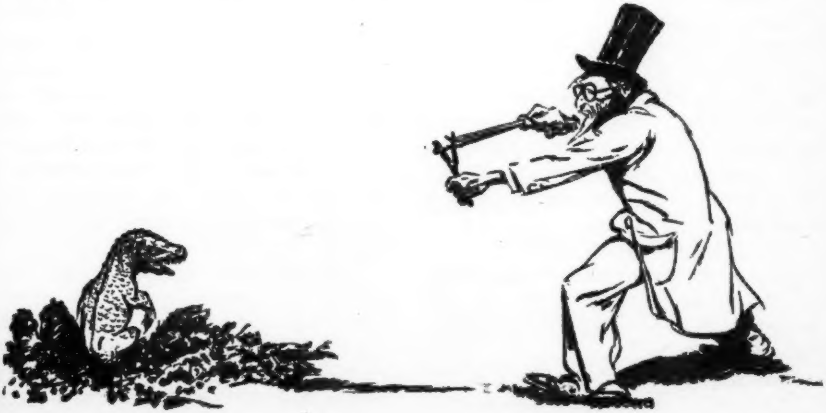
"Looked like?" said the little man. "How could it look like anything? I told you that there isn't any such thing as a time machine. There couldn't be; it would be a complete paradox. Time is a fixed dimension. And when I proved that to myself, that's what drove me crazy."

"When was that?"

"About four million years from now, around 1941. I had my heart set on making one, and went batty when I couldn't."

"Oh," said Shorty. "Listen, how come I couldn't see you, up there in the future, and I can here? And which world of four million years ago *is* this; yours or mine?"

"The same thing answers both of those questions. This is neutral ground; it's before there was a bifurcation of sanity and insanity. The dinosaurs are aw-



fully dumb; they haven't got brains enough to be insane, let alone normal. They don't know from anything. They don't know there couldn't be a time machine. That's why we can come here."

"Oh," said Shorty again. And that held him for a while. Somehow it didn't seem particularly strange any more that he should be waiting to see a dinosaur hunted with a sling shot. The mad part of it was that he should be waiting for a dinosaur *at all.* Granting that, it wouldn't have seemed any sillier to have sat here waiting for one with a—

"Say," he said, "if using a sling shot on those things is sporting, did you ever try a fly swatter?"

The little man's eyes lighted up. "That," he said, "*is* an idea. Say, maybe you really *are* eligible for—"

"No," said Shorty hastily. "I was just kidding, honest. But, listen—"

"I don't hear anything."

"I don't mean that; I mean—well, listen, pretty soon I'm going to wake up or something, and there are a couple questions I'd like to ask while . . . while you're still here."

"You mean while *you're* still here," said the little man. "I told you that your getting in on this with me was a pure accident, and one moreover that I'm going to have to take up with Napo—"

"Damn Napoleon," said Shorty. "Listen, can you answer this so I can understand it? *Are* we here, or *aren't* we? I mean, if there's a time machine there by you, how can it be there if there can't be a time machine? And am I, or am I not, still back in Professor Dolohan's classroom, and if I am, what am I doing here? And—oh, darn it; what's it all about?"

The little man smiled wistfully.

"I can see that you are quite thoroughly mixed up. I might as well straighten you out. Do you know anything about logic?"

"Well, a little, Mr. . . . uh—"

"Call me Dopey. And if you know a little about logic, *that's your trouble.* Just forget it and remember that I'm crazy, and that makes things different, doesn't it? A crazy person doesn't have to be logical. Our worlds are different, don't you see? Now you're what we call a normal; that is, you see things the same as everybody else. But we don't. And since matter is most obviously a mere concept of mind—"

"Is it?"

"Of course."

"But *that's* according to Logic. Descartes—"

The little man waved his sling shot airily. "Oh, yes. But not according to other philosophers. The dualists. That's where the logicians cross us up. They divide into two camps and take diametrically opposite sides of a question, and they can't both be wrong. Silly, isn't it? But the fact remains that matter is a concept of consciousness, even if some people who aren't really crazy think it is. Now there is a normal concept of matter, which you share, and a whole flock of abnormal ones. The abnormal ones sort of get together."

"I don't quite understand. You mean that you have a secret society of . . . uh . . . lunatics, who . . . uh . . . live in a different world, as it were?"

"Not as it were," corrected the little man emphatically, "but *as it weren't.* And it isn't a secret society, or anything organized that way. It just *is.* We project into two universes, in a manner of speaking. One is normal; our bodies are born there, and of course, they stay there. And if we're crazy enough to attract attention, we get put into asylums there. But we have another existence, in our minds. That's where I am, and that's where you are at the moment, in my mind. I'm not really here, either."

"*Whew!*" said Shorty. But how *could* I be in your—"

"I told you; the machine slipped. But the logic hasn't much place in my world. A paradox more or less doesn't matter, and a time machine is a mere bagatelle. Lots of us have them. Lots of us have come back here hunting with them. That's how we killed off the dinosaurs and that's why—"

"Wait," said Shorty. "Is this world we're sitting in, the Jurassic, part of your . . . uh . . . concept, or is it real? It looks real, and it looks authentic."

"This is real, but it never really existed. That's obvious. If matter is a concept of mind, and the saurians hadn't any minds, then how could they have had a world to live in, except that we thought it up for them afterward?"

"Oh," said Shorty weakly. His mind was going in buzzing circles. "You mean that the dinosaurs never really—"

"Here comes one," said the little man.

Shorty jumped. He looked around wildly and couldn't see anything that looked like a dinosaur.

"Down there," said the little man, "coming through those bushes. Watch this shot."

Shorty looked down as his companion raised the sling shot. A small lizard-like creature, but hopping erect as no lizard hops, was coming around one of the stunted bushes. It stood about a foot and a half high.

There was a sharp pinging sound as the rubber snapped, and a thud as the stone hit the creature between the eyes. It dropped, and the little man went over and picked it up.

"You can shoot the next one," he said.

Shorty gawked at the dead saurian. "A struthiomimus!" he said. "Golly. But what if a big one comes along? A brontosaurus, say, or a Tyrannosaurus Rex?"

"They're all gone. We killed them off. There's only the little ones left, but it's better than hunting rabbits, isn't it? Well, one's enough for me this time. I'm getting bored, but I'll wait for you to shoot one if you want to."

Shorty shook his head. "Afraid I couldn't aim straight enough with that

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sling shot. I'll skip it. Where's the time machine?"

"Right here. Take two steps ahead of you."

Shorty did, and the lights went out again.

"Just a minute," said the little man's voice, "I'll set the levers. And you want off where you got on?"

"Uh . . . it might be a good idea. I might find myself in a mess otherwise. Where are we now?"

"Back in 1948. That guy is still telling his class what *he* thinks happened to the dinosaurs. And that red-headed girl— Say, she really *is* a honey. Want to pull her hair again?"

"No," said Shorty. "But I want off in 1943. How's this going to get me there?"

"You got on here, from 1943, didn't you. It's the warp. I think this will put you off just right."

"You *think?*" Shorty was startled. "Listen, what if I get off the day before and sit down on my own lap in that classroom?"

The voice laughed. "You couldn't do that; you're not crazy. But I did, once. Well, get going. I want to get back to—"

"Thanks for the ride," said Shorty. "But—wait—I still got one question to ask. About those dinosaurs."

"Yes? Well, hurry; the warp might not hold."

"The big ones, the really big ones. How the devil did you kill *them* with sling shots? Or did you?"

The little man chuckled. "Of course, we did. We just used bigger sling shots, that's all. Good-by."

Shorty felt a push, and light blinded him again. He was standing in the aisle of the classroom.

"Mr. McCabe," said the sarcastic voice of Professor Dolohan, "class is not dismissed for five minutes yet. Will you be so kind as to resume your seat? And were you, may I ask, somnambulating?"

Shorty sat down hastily. He said, "I . . . uh— Sorry, professor."

He sat out the rest of the period in a daze. It had seemed too vivid for a dream, and his fountain pen was still gone. But, of course, he could have lost that elsewhere. But the whole thing had been so vivid that it was a full day before he could convince himself that he'd dreamed it, and a week before he could forget about it, for long at a time.

Only gradually did the memory of it fade. A year later, he still vaguely remembered that he'd had a particularly screwy dream. But not five years later; no dream is remembered that long.

He was an associate professor now, and had his own class in paleontology. "The saurians," he was telling them, "died out in the late Jurassic age. Becoming too large and unwieldly to supply themselves with food—"

As he talked, he was staring at the pretty red-headed graduate student in the back row. And wondering how he could get up the nerve to ask her for a date.

There was a bluebottle fly in the room; it had risen in a droning spiral from a point somewhere at the back of the room. It reminded Professor McCabe of something, and while he talked, he tried to remember what it was. And just then the girl in the back row jumped suddenly and yipped.

"Miss Willis," said Professor McCabe, "is something wrong?"

"I . . . I thought something pulled my hair, professor," she said. She blushed, and that made her more of a knockout than ever. "I . . . I guess I must have dozed off."

He looked at her—severely, because the eyes of the class were upon him. But this was just the chance he'd been waiting and hoping for. He said, "Miss Willis, will you please remain after class?"

THE END.

The Proud Robot

by Lewis Padgett

Gallegher, the mad—or at least pie-eyed—scientist had produced a remarkable robot. But seemingly useless. It spent its time admiring its unquestionably remarkable, if not beautiful, self. But Gallegher had to find out—but quick!—why he'd made the infernal thing.

Illustrated by Kramer

ORIGINALLY the robot was intended to be a can opener. Things often happened that way with Gallegher, who played at science by ear. He was, as he often remarked, a casual genius. Sometimes he'd start with a twist of wire, a few batteries, and a button hook, and before he finished, he might contrive a new type of refrigerating unit. The affair of the time locker had begun that way, with Gallegher singing hoarsely under his breath and peering, quite drunk, into cans of paint.

At the moment he was nursing a hangover. A disjointed, lanky, vaguely boneless man with a lock of dark hair falling untidily over his forehead, he lay on the couch in the lab and manipulated his mechanical liquor bar. A very dry Martini drizzled slowly from the spigot into his receptive mouth.

He was trying to remember something, but not trying too hard. It had to do with the robot, of course. Well, it didn't matter.

"Hey, Joe," Gallegher said.

The robot stood proudly before the mirror and examined its innards. Its hull was transparent, and wheels were going around at a great rate inside.

"When you call me that," Joe remarked, "whisper. And get that cat out of here."

"Your ears aren't that good."

"They are. I can hear the cat walking about, all right."

"What does it sound like?" Gallegher inquired, interested.

"Just like drums," said the robot, with a put-upon air. "And when you talk, it's like thunder." Joe's voice was a discordant squeak, so Gallegher meditated on saying something about glass-houses and casting the first stone. He brought his attention, with some effort, to the luminous door panel, where a shadow loomed—a familiar shadow, Gallegher thought.

"It's Brock," the annunciator said. "Harrison Brock. Let me in!"

"The door's unlocked." Gallegher didn't stir. He looked gravely at the well-dressed, middle-aged man who came in, and tried to remember. Brock was between forty and fifty; he had a smoothly massaged, clean-shaved face, and wore an expression of harassed intolerance. Probably Gallegher knew the man. He wasn't sure. Oh, well.

Brock looked around the big, untidy

laboratory, blinked at the robot, searched for a chair, and failed to find it. Arms akimbo, he rocked back and forth and glared at the prostrate scientist.

"Well?" he said.

"Never start conversations that way," Gallegher mumbled, siphoning another Martini down his gullet. "I've had enough trouble today. Sit down and take it easy. There's a dynamo behind you. It isn't very dusty, is it?"

"Did you get it?" Brock snapped. "That's all I want to know. You've had a week. I've a check for ten thousand in my pocket. Do you want it, or don't you?"

"Sure," Gallegher said. He extended a large, groping hand. "Give."

"*Caveat emptor.* What am I buying?"

"Don't you know?" the scientist asked, honestly puzzled.

Brock began to bounce up and down in a harassed fashion. "My God," he said. "They told me you could help me if anybody could. Sure. And they also said it'd be like pulling teeth to get sense out of you. Are you a technician or a driveling idiot?"

Gallegher pondered. "Wait a minute. I'm beginning to remember. I talked to you last week, didn't I?"

"You talked—" Brock's round face turned pink. "Yes! You lay there swilling liquor and babbled poetry. You sang "Frankie and Johnnie." And you finally got around to accepting my commission."

"The fact is," Gallegher said, "I have been drunk. I often get drunk. Especially on my vacation. It releases my subconscious, and then I can work. I've made my best gadgets when I was tizzied," he went on happily. "Everything seems so clear then. Clear as a bell. I mean a bell, don't I? Anyway—" He lost the thread and looked puzzled. "Anyway, what are you talking about?"

"Are you going to keep quiet?" the robot demanded from its post before the mirror.

Brock jumped. Gallegher waved a casual hand. "Don't mind Joe. I just finished him last night, and I rather regret it."

"A robot?"

"A robot. But he's no good, you know. I made him when I was drunk, and I haven't the slightest idea how or why. All he'll do is stand there and admire himself. And sing. He sings like a banshee. You'll hear him presently."

With an effort Brock brought his attention back to the matter in hand. "Now look, Gallegher. I'm in a spot. You promised to help me. If you don't, I'm a ruined man."

"I've been ruined for years," the scientist remarked. "It never bothers me. I just go along working for a living and making things in my spare time. Making all sorts of things. You know, if I'd really studied, I'd have been another Einstein. So they tell me. As it is, my subconscious picked up a first-class scientific training somewhere. Probably that's why I never bothered. When I'm drunk or sufficiently absent-minded, I can work out the damnedest problems."

"You're drunk now," Brock accused.

"I approach the pleasanter stages. How would you feel if you woke up and found you'd made a robot for some unknown reason, and hadn't the slightest idea of the creature's attributes?"

"Well—"

"I don't feel that way at all," Gallegher murmured. "Probably you take life too seriously, Brock. Wine is a mocker; strong drink is raging. Pardon me. I rage." He drank another Martini.

Brock began to pace around the crowded laboratory, circling various enigmatic and untidy objects. "If you're a scientist, Heaven help science."

"I'm the Larry Adler of science," Gallegher said. "He was a musician—lived some hundreds of years ago, I think. I'm like him. Never took a lesson in my life. Can I help it if my subconscious likes practical jokes?"

"Do you know who I am?" Brock demanded.

"Candidly, no. Should I?"

There was bitterness in the other's voice. "You might have the courtesy to remember, even though it was a week ago. Harrison Brock. Me. I own Vox-View Pictures."

"No," the robot said suddenly, "it's no use. No use at all, Brock."

"What the—"

Gallegher sighed wearily. "I forget the damned thing's alive. Mr. Brock, meet Joe. Joe, meet Mr. Brock—of Vox-View."

Joe turned, gears meshing within his transparent skull. "I am glad to meet you, Mr. Brock. Allow me to congratulate you on your good fortune in hearing my lovely voice."

"Uh," said the magnate inarticulately. "Hello."

"Vanity of vanities, all is vanity," Gallegher put in, *sotto voce*. "Joe's like that. A peacock. No use arguing with him, either."

The robot ignored this aside. "But it's no use, Mr. Brock," he went on squeakily. "I'm not interested in money. I realize it would bring happiness to many if I consented to appear in your pictures, but fame means nothing to me. Nothing. Consciousness of beauty is enough."

Brock began to chew his lips. "Look," he said savagely, "I didn't come here to offer you a picture job. See? Am I offering you a contract? Such colossal nerve— *Pah!* You're crazy."

"Your schemes are perfectly transparent," the robot remarked coldly. "I can see that you're overwhelmed by my beauty and the loveliness of my voice—its grand tonal qualities. You needn't pretend you don't want me, just so you can get me at a lower price. I said I wasn't interested."

"You're *cr-r-razy!*" Brock howled, badgered beyond endurance, and Joe calmly turned back to his mirror.

"Don't talk so loudly," the robot warned. "The discordance is deafening. Besides, you're ugly and I don't like to look at you." Wheels and cogs buzzed inside the transplastic shell. Joe extended his eyes on stalks and regarded himself with every appearance of appreciation.

Gallegher was chuckling quietly on the couch. "Joe has a high irritation value," he said. "I've found that out already. I must have given him some remarkable senses, too. An hour ago he started to laugh his damn fool head off. No reason, apparently. I was fixing myself a bite to eat. Ten minutes after that I slipped on an apple core I'd thrown away and came down hard. Joe just looked at me. 'That was it,' he said. 'Logics of probability. Cause and effect. I knew you were going to drop that apple core and then step on it when you went to pick up the mail.' Like the White Queen, I suppose. It's a poor memory that doesn't work both ways."

Brock sat on the small dynamo—there were two, the larger one named Monstro, and the smaller one serving Gallegher as a bank—and took deep breaths. "Robots are nothing new."

"This one is. I hate its gears. It's beginning to give me an inferiority complex. Wish I knew why I'd made it," Gallegher sighed. "Oh, well. Have a drink?"

"No. I came here on business. Do you seriously mean you spent last week building a robot instead of solving the problem I hired you for?"

"Contingent, wasn't it?" Gallegher asked. "I think I remember that."

"Contingent," Brock said with satisfaction. "Ten thousand, if and when."

"Why not give me the dough and take the robot? He's worth that. Put him in one of your pictures."

"I won't have any pictures unless you figure out an answer," Brock snapped. "I told you all about it."

"I have been drunk," Gallegher said. "My mind has been wiped clear, as by a sponge. I am as a little child. Soon I shall be as a drunken little child. Meanwhile, if you'd care to explain the matter again—"

Brock gulped down his passion, jerked a magazine at random from the bookshelf, and took out a stylo. "All right. My preferred stocks are at twenty-eight, 'way below par—" He scribbled figures on the magazine.

"If you'd taken that medieval folio next to that, it'd have cost you a pretty penny," Gallegher said lazily. "So you're the sort of guy who writes on tablecloths, eh? Forget this business of stocks and stuff. Get down to cases. Who are you trying to gyp?"

"It's no use," the robot said from before its mirror. "I won't sign a contract. People may come and admire me, if they like, but they'll have to whisper in my presence."

"A madhouse," Brock muttered, trying to get a grip on himself. "Listen, Gallegher. I told you all this a week ago, but—"

"Joe wasn't here then. Pretend like you're talking to him."

"Uh—look. You've heard of Vox-View Pictures, at least."

"Sure. The biggest and best television company in the business. Sonatone's about your only competitor."

"Sonatone's squeezing me out."

Gallegher looked puzzled. "I don't see how. You've got the best product. Tri-dimensional color, all sorts of modern improvements, the top actors, musicians, singers—"

"No use," the robot said. "I won't."

"Shut up, Joe. You're tops in your field, Brock. I'll hand you that. And I've always heard you were fairly ethical. What's Sonatone got on you?"

Brock made helpless gestures. "Oh, it's politics. The bootleg theaters. I can't buck 'em. Sonatone helped elect the present administration, and the police just wink when I try to have the bootleggers raided."

"Bootleg theaters?" Gallegher asked, scowling a trifle. "I've heard something—"

"It goes 'way back. To the old sound-film days. Home television killed sound film and big theaters. People were conditioned away from sitting in audience groups to watch a screen. The home televisors got good. It was more fun to sit in an easy-chair, drink beer, and watch the show. Television wasn't a rich man's hobby by that time. The meter system brought the price down to middle-class levels. Everybody knows that."

"I don't," Gallegher said. "I never pay attention to what goes on outside of my lab, unless I have to. Liquor and a selective mind. I ignore everything that doesn't affect me directly. Explain the whole thing in detail, so I'll get a complete picture. I don't mind repetition. Now, what about this meter system of yours?"

"Televisors are installed free. We never sell 'em; we rent them. People pay according to how many hours they have the set tuned in. We run a continuous show, stage plays, wire-tape films, operas, orchestras, singers, vaudeville—everything. If you use your televisor a lot, you pay proportionately. The man comes around once a month and reads the meter. Which is a fair system. Anybody can afford a Vox-View. Sonatone and the other companies do the same thing, but Sonatone's the only big competitor I've got. At least, the only one that's crooked as hell. The rest of the boys—they're smaller than I am, but I don't step on their toes. Nobody's ever called me a louse," Brock said darkly.

"So what?"

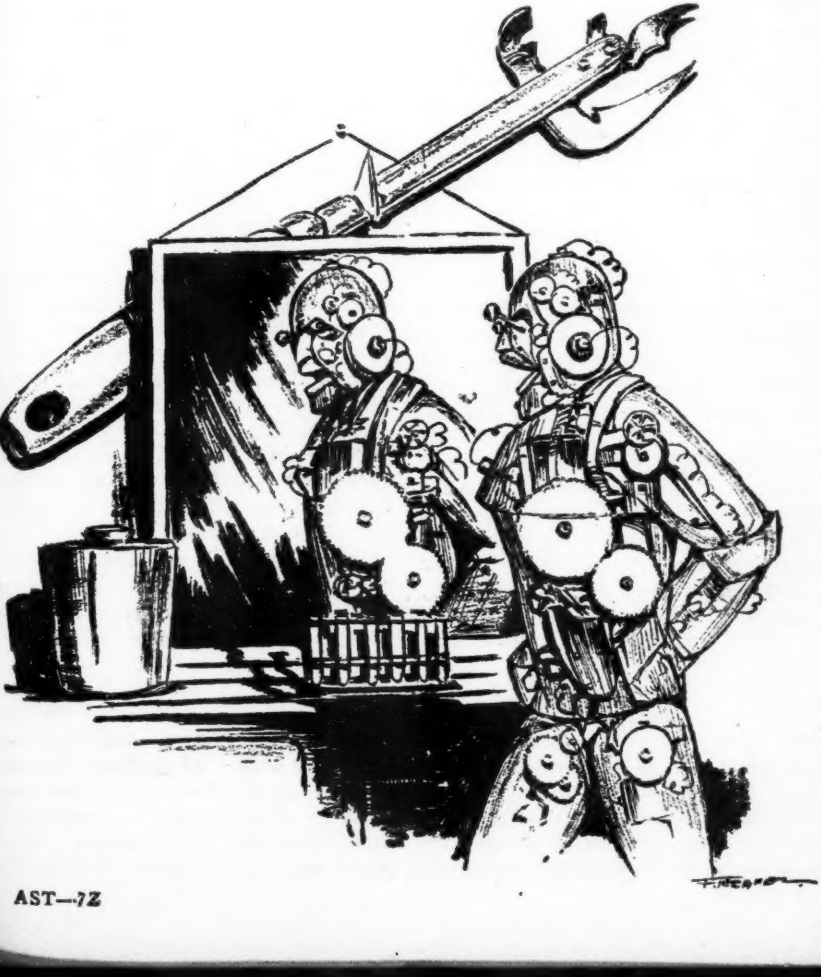
"So Sonatone has started to depend on audience appeal. It was impossible till lately—you couldn't magnify tri-dimensional television on a big screen without streakiness and mirage-effect. That's why the regular three-by-four home screens were used. Results were perfect. But Sonatone's bought a lot of the ghost theaters all over the country—"

"What's a ghost theater?" Gallegher asked.

"Well—before sound films collapsed, the world was thinking big. Big—you know? Ever heard of the Radio City Music Hall? That wasn't in it! Television was coming in, and competition was fierce. Sound-film theaters got bigger and more elaborate. They were palaces. Tremendous. But when television was perfected, nobody went to the theaters any more, and it was often too expensive a job to tear 'em down. Ghost theaters—see? Big ones and little ones. Renovated them. And they're showing Sonatone programs. Audience appeal is quite a factor. The theaters charge plenty, but people flock into 'em. Novelty and the mob instinct."

Gallegher closed his eyes. "What's to stop you from doing the same thing?"

"Patents," Brock said briefly. "I mentioned that dimensional television couldn't be used on big screens till lately. Sonatone signed an agreement with me ten years ago that any enlarging improvements would be used mutually. They crawled out of that contract. Said



it was faked, and the courts upheld them. They uphold the courts—politics. Anyhow, Sonatone's technicians worked out a method of using the large screen. They took out patents—twenty-seven patents, in fact, covering every possible variation on the idea. My technical staff has been working day and night trying to find some similar method that won't be an infringement, but Sonatone's got it all sewed up. They've a system called the Magna. It can be hooked up to any type of televisor—but they'll only allow it to be used on Sonatone machines. See?"

"Unethical, but legal," Gallegher said. "Still, you're giving your customers more for their money. People want good stuff. The size doesn't matter."

"Yeah," Brock said bitterly, "but that isn't all. The newstapes are full of A. A.—it's a new catchword. Audience Appeal. The herd instinct. You're right about people wanting good stuff—but would you buy Scotch at four a quart if you could get it for half that amount?"

"Depends on the quality. What's happening?"

"Bootleg theaters," Brock said. "They've opened all over the country. They show Vox-View products, and they're using the Magna enlarger system Sonatone's got patented. The admission price is low—lower than the rate of owning a Vox-View in your own home. There's audience appeal. There's the thrill of something a bit illegal. People are having their Vox-Views taken out right and left. I know why. They can go to a bootleg theater instead."

"It's illegal," Gallegher said thoughtfully.

"So were speakeasies, in the Prohibition Era. A matter of protection, that's all. I can't get any action through the courts. I've tried. I'm running in the red. Eventually I'll be broke. I can"t lower my home rental fees on Vox-Views. They're nominal already. I make my profits through quantity. Now, no profits. As for these bootleg theaters, it's pretty obvious who's backing them."

"Sonatone?"

"Sure. Silent partners. They get the take at the box office. What they want is to squeeze me out of business, so they'll have a monopoly. After that, they'll give the public junk and pay their artists starvation salaries. With me it's different. I pay my staff what they're worth—plenty."

"And you offered me a lousy ten thousand," Gallegher remarked. "Uh-*huh!*"

"That was only the first installment," Brock said hastily. "You can name your own fee. Within reason," he added.

"I shall. An astronomical sum. Did I say I'd accept the commission a week ago?"

"You did."

"Then I must have had some idea how to solve the problem," Gallegher pondered. "Let's see. I didn't mention anything in particular, did I?"

"You kept talking about marble slabs and . . . uh . . . your sweetie."

"Then I was singing," Gallegher explained largely. "'St. James Infirmary.' Singing calms my nerves, and Lord knows they need it sometimes. Music and liquor. I often wonder what the vintners buy—"

"What?"

"'One half so precious as the stuff they sell.' Let it go. I am quoting Omar. It means nothing. Are your technicians any good?"

"The best. And the best paid."

"They can't find a magnifying process that won't infringe on the Sonatone Magna patents?"

"In a nutshell, that's it."

"I suppose I'll have to do some research," Gallegher said sadly. "I hate it like poison. Still, the sum of the parts equals the whole. Does that make sense to you? It doesn't to me. I have trouble with words. After I say things, I start wondering what I've said. Better than watching a play," he finished wildly. "I've got a headache. Too much talk and not enough liquor. Where were we?"

"Approaching the madhouse," Brock suggested. "If you weren't my last resort, I'd—"

"No use," the robot said squeakily. "You might as well tear up your contract, Brock. I won't sign it. Fame means nothing to me—nothing."

"If you don't shut up," Gallegher warned, "I'm going to scream in your ears."

"All right!" Joe shrilled. "Beat me! Go on, beat me! The meaner you are, the faster I'll have my nervous system disrupted, and then I'll be dead. I don't care. I've got no instinct of self-preservation. Beat me. See if I care."

"He's right, you know," the scientist said after a pause. "And it's the only logical way to respond to blackmail or threats. The sooner it's over, the better. There aren't any gradations with Joe. Anything really painful to him will destroy him. And he doesn't give a damn."

"Neither do I," Brock grunted. "What I want to find out—"

"Yeah. I know. Well, I'll wander around and see what occurs to me. Can I get into your studios?"

"Here's a pass." Brock scribbled something on the back of a card. "Will you get to work on it right away?"

"Sure," Gallegher lied. "Now you run along and take it easy. Try and cool off. Everything's under control. I'll either find a solution to your problem pretty soon or else—"

"Or else what?"

"Or else I won't," the scientist finished blandly, and fingered the buttons on a control panel near the couch. "I'm tired of Martinis. Why didn't I make that robot a mechanical bartender, while I was at it? Even the effort of selecting and pushing buttons is depressing at times. Yeah, I'll get to work on the business, Brock. Forget it."

The magnate hesitated. "Well, you're my only hope. I needn't bother to mention that if there's anything I can do to help you—"

"A blonde," Gallegher murmured. "That gorgeous, gorgeous star of yours, Silver O'Keefe. Send her over. Otherwise I want nothing."

"Good-by, Brock," the robot said squeakily. "Sorry we couldn't get together on the contract, but at least you've had the ineluctable delight of hearing my beautiful voice, not to mention the pleasure of seeing me. Don't tell too many people how lovely I am. I really don't want to be bothered with mobs. They're noisy."

"You don't know what dogmatism means till you've talked to Joe," Gallegher said. "Oh, well. See you later. Don't forget the blonde."

Brock's lips quivered. He searched for words, gave it up as a vain task, and turned to the door.

"Good-by, you ugly man," Joe said.

Gallegher winced as the door slammed, though it was harder on the robot's supersensitive ears than on his own. "Why do you go on like that?" he inquired. "You nearly gave the guy apoplexy."

"Surely he didn't think he was beautiful," Joe remarked.

"Beauty's in the eye of the beholder."

"How stupid you are. You're ugly, too."

"And you're a collection of rattletrap gears, pistons and cogs. You've got worms," said Gallegher, referring, of course, to certain mechanisms in the robot's body.

"I'm lovely." Joe stared raptly into the mirror.

"Maybe, to you. Why did I make you transparent, I wonder?"

"So others could admire me. I have X-ray vision, of course."

"And wheels in your head. Why did I put your radioatomic brain in your stomach? Protection?"

Joe didn't answer. He was humming in a maddeningly squeaky voice, shrill and nerve-racking. Gallegher stood it for a while, fortifying himself with a gin rickey from the siphon.

"Get it up!" he yelped at last. "You sound like an old-fashioned subway train going round a curve."

"You're merely jealous," Joe scoffed, but obediently raised his tone to a supersonic pitch. There was silence for a half-minute. Then all the dogs in the neighborhood began to howl.

Wearily Gallegher dragged his lanky frame up from the couch. He might as well get out. Obviously there was no peace to be had in the laboratory. Not with that animated junk pile inflating his ego all over the place. Joe began to laugh in an off-key cackle. Gallegher winced.

"What now?"

"You'll find out."

Logic of causation and effect, influenced by probabilities, X-ray vision and other enigmatic senses the robot no doubt possessed. Gallegher cursed softly, found a shapeless black hat, and made for the door. He opened it to admit a short, fat man who bounced painfully off the scientist's stomach.

"Whoof! Uh. What a corny sense of humor that jackass has. Hello, Mr. Kennicott. Glad to see you. Sorry I can't offer you a drink."

Mr. Kennicott's swarthy face twisted malignantly. "Don' wanna no drink. Wanna my money. You gimme. Howzabout it?"

Gallegher looked thoughtfully at nothing. "Well, the fact is, I was just going to collect a check."

"I sella you my diamonds. You say you gonna make somet'ing wit' 'em. You gimme check before. It go bounca, bounca, bounca. Why is?"

"It was rubber," Gallegher said faintly. "I never can keep track of my bank balance."

Kennicott showed symptoms of going bounca on the threshold. "You gimme back diamonds, eh?"

"Well, I used 'em in an experiment. I forget just what. You know, Mr. Kennicott, I think I was a little drunk when I bought them, wasn't I?"

"Dronk," the little man agreed. "Mad wit' vino, sure. So whatta? I wait no longer. Awready you put me off too much. Pay up now or elsa."

"Go away, you dirty man," Joe said from within the room. "You're awful."

Gallegher hastily shouldered Kennicott out into the street and latched the door behind him. "A parrot," he explained. "I'm going to wring its neck pretty soon. Now about that money. I admit I owe it to you. I've just taken on a big job, and when I'm paid, you'll get yours."

"Bah to such stuff," Kennicott said. "You gotta position, eh? You are technician wit' some big company, eh? Ask for ahead-salary."

"I did," Gallegher sighed. "I've drawn my salary for six months ahead. Now look, I'll have that dough for you in a couple of days. Maybe I can get an advance from my client. O. K.?"

"No."

"No?"

"Ah-h, nutsa. I waita one day. Two daysa, maybe. Enough. You get money. Awright. If not, O. K., *calabozo* for you."

"Two days is plenty," Gallegher said, relieved. "Say, are there any of those bootleg theaters around here?"

"Better you get to work an' not waste time."

"That's my work. I'm making a survey. How can I find a bootleg place?"

"Easy. You go downtown, see guy in doorway. He sell you tickets. Anywhere. All over."

"Swell," Gallegher said, and bade the little man adieu. Why had he bought diamonds from Kennicott? It would be almost worth while to have his subconscious amputated. It did the most extraordinary things. It worked on inflexible principles of logic, but that logic was completely alien to Gallegher's conscious mind. The results, though, were often surprisingly good, and always surprising. That was the worst of being a scientist who knew no science—who played by ear.

There was diamond dust in a retort in the laboratory, from some unsatisfactory experiment Gallegher's subconscious had performed; and he had a fleeting memory of buying the stones from Kennicott. Curious. Maybe—oh, yeah. They'd gone into Joe. Bearings or something. Dismantling the robot wouldn't help now, for the diamonds had certainly been reground. Why the devil hadn't he used commercial stones, quite as satisfactory, instead of purchasing blue-whites of the finest water? The best was none too good for Gallegher's subconscious. It had a fine freedom from commercial instincts. It just didn't understand the price system or the basic principles of economics.

Gallegher wandered downtown like a Diogenes seeking truth. It was early evening, and the luminates were flickering on overhead, pale bars of light against darkness. A sky sign blazed above Manhattan's towers. Air-taxis, skimming along at various arbitrary levels, paused for passengers at the elevator landings. Heigh-ho.

Downtown, Gallegher began to look for doorways. He found an occupied one at last, but the man was selling post cards. Gallegher declined and headed for the nearest bar, feeling the need of replenishment. It was a mobile bar, combining the worst features of a Coney Island ride with uninspired cocktails, and Gallegher hesitated on the threshold. But at last he seized a chair as it swung past and relaxed as much as possible. He ordered three rickeys and drank them in rapid succession. After that he called the bartender over and asked him about bootleg theaters.

"Hell, yes," the man said, producing a sheaf of tickets from his apron. "How many?"

"One. Where do I go?"

"Two-twenty-eight. This street. Ask for Tony."

"Thanks," Gallegher said, and, having paid exorbitantly, crawled out of the chair and weaved away. Mobile bars were an improvement he didn't appreciate. Drinking, he felt, should be performed in a state of stasis, since one eventually reached that stage, anyway.

The door was at the bottom of a flight of steps, and there was a grilled panel set in it. When Gallegher knocked, the visascreen lit up—obviously a one-way circuit, for the doorman was invisible.

"Tony here?" Gallegher said.

The door opened, revealing a tired-looking man in pneumo-slacks, which failed in their purpose of building up his skinny figure. "Got a ticket? Let's have it. O. K., bud. Straight ahead. Show now going on. Liquor served in the bar on your left."

Gallegher pushed through soundproofed curtains at the end of a short corridor and found himself in what appeared to be the foyer of an ancient theater, *circa* 1980, when plastics were the great fad. He smelled out the bar, drank expensively priced cheap liquor, and, fortified, entered the theater itself. It was nearly full. The great screen—a Magna, presumably—was filled with people doing things to a spaceship. Either an adventure film or a newsreel, Gallegher realized.

Only the thrill of lawbreaking would have enticed the audience into the bootleg theater. It smelled. It was certainly run on a shoestring, and there were no ushers. But it was illicit, and therefore well patronized. Gallegher looked thoughtfully at the screen. No streakiness, no mirage effect. A Magna enlarger had been fitted to a Vox-View unlicensed televisor, and one of Brock's greatest stars was emoting effectively for the benefit of the bootleggers' patrons. Simple highjacking. Yeah.

After a while Gallegher went out, noticing a uniformed policeman in one of the aisle seats. He grinned sardonically. The flatfoot hadn't paid his admission, of course. Politics were as usual.

Two blocks down the street a blaze

of light announced SONATONE BIJOU. This, of course, was one of the legalized theaters, and correspondingly high-priced. Gallegher recklessly squandered a small fortune on a good seat. He was interested in comparing notes, and discovered that, as far as he could make out, the Magna in the Bijou and the bootleg theater were identical. Both did their job perfectly. The difficult task of enlarging television screens had been successfully surmounted.

In the Bijou, however, all was palatial. Resplendent ushers salaamed to the rugs. Bars dispensed free liquor, in reasonable quantities. There was a Turkish bath. Gallegher went through a door labeled MEN and emerged quite dazzled by the splendor of the place. For at least ten minutes afterward he felt like a Sybarite.

All of which meant that those who could afford it went to the legalized Sonatone theaters, and the rest attended the bootleg places. All but a few homebodies, who weren't carried off their feet by the new fad. Eventually Brock would be forced out of business for lack of revenue. Sonatone would take over, jacking up their prices and concentrating on making money. Amusement was necessary to life; people had been conditioned to television. There was no substitute. They'd pay and pay for inferior talent, once Sonatone succeeded in their squeeze.

Gallegher left the Bijou and hailed an air-taxi. He gave the address of Vox-View's Long Island studio, with some vague hope of getting a drawing account out of Brock. Then, too, he wanted to investigate further.

Vox-View's eastern offices sprawled wildly over Long Island, bordering the Sound, a vast collection of variously shaped buildings. Gallegher instinctively found the commissary, where he obsorbed more liquor as a precautionary measure. His subconscious had a heavy job ahead, and he didn't want it handicapped by lack of complete freedom. Besides, the Collins was good.

After one drink, he decided he'd had enough for a while. He wasn't a superman, though his capacity was slightly incredible. Just enough for objective clarity and subjective release—

"Is the studio always open at night?" he asked the waiter.

"Sure. Some of the stages, anyway. It's a round-the-clock program."

"The commissary's full."

"We get the airport crowd, too. 'Nother?"

Gallegher shook his head and went out. The card Brock had given him provided entree at a gate, and he went first of all to the big-shot's office. Brock wasn't there, but loud voices emerged, shrilly feminine.

The secretary said, "Just a minute, please," and used her interoffice visor. Presently—"Will you go in?"

Gallegher did. The office was a honey, functional and luxurious at the same time. Three-dimensional stills were in niches along the walls—Vox-View's biggest stars. A small, excited, pretty brunette was sitting behind the desk, and a blond angel was standing furiously on the other side of it. Gallegher recognized the angel as Silver O'Keefe.

He seized the opportunity. "Hiya, Miss O'Keefe. Will you autograph an ice cube for me? In a highball?"

Silver looked feline. "Sorry, darling, but I'm a working girl. And I'm busy right now."

The brunette scratched a cigarette. "Let's settle this later, Silver. Pop said to see this guy if he dropped in. It's important."

"It'll be settled," Silver said. "And soon." She made an exit. Gallegher whistled thoughtfully at the closed door.

"You can't have it," the brunette said. "It's under contract. And it wants to get out of the contract, so it can sign up with Sonatone. Rats desert a sinking ship. Silver's been kicking her head off ever since she read the storm signals."

"Yeah?"

"Sit down and smoke or something. I'm Patsy Brock. Pop runs this business, and I manage the controls whenever he blows his top. The old goat can't stand trouble. He takes it as a personal affront."

Gallegher found a chair. "So Silver's trying to renege, eh? How many others?"

"Not many. Most of 'em are loyal. But, of course, if we bust up—" Patsy Brock shrugged. "They'll either work for Sonatone for their cakes, or else do without."

"Uh-huh. Well—I want to see your technicians. I want to look over the ideas they've worked out for enlarger screens."

"Suit yourself," Patsy said. "It's not much use. You just can't make a televisor enlarger without infringing on some Sonatone patent."

She pushed a button, murmured something into a visor, and presently two tall glasses appeared through a slot in the desk. "Mr. Gallegher?"

"Well, since it's a Collins—"

"I could tell by your breath," Patsy said enigmatically. "Pop told me he'd seen you. He seemed a bit upset, especially by your new robot. What is it like, anyway?"

"Oh, I don't know," Gallegher said, at a loss. "It's got lots of abilities—new senses, I think—but I haven't the slightest idea what it's good for. Except admiring itself in a mirror."

Patsy nodded. "I'd like to see it sometime. But about this Sonatone business. Do you think you can figure out an answer?"

"Possibly. Probably."

"Not certainly?"

"Certainly, then. Of that there is no manner of doubt—no possible doubt whatever."

"Because it's important to me. The man who owns Sonatone is Elia Tone. A piratical skunk. He blusters. He's got a son named Jimmy. And Jimmy, believe it or not, has read 'Romeo and Juliet.' "

"Nice guy?"

"A louse. A big, brawny louse. He wants me to marry him."

" 'Two families, both alike in—' "

"Spare me," Patsy interrupted. "I always thought Romeo was a dope, anyway. And if I ever thought I was going aisling with Jimmy Tone, I'd buy a one-way ticket to the nut hatch. No, Mr. Gallegher, it's not like that. No hibiscus blossoms. Jimmy has proposed to me—his idea of a proposal, by the way, is to get a half Nelson on a girl and tell her how lucky she is."

"Ah," said Gallegher, diving into his Collins.

"This whole idea—the patent monopoly and the bootleg theaters—is Jimmy's. I'm sure of that. His father's in on it, too, of course, but Jimmy Tone is the bright little boy who started it."

"Why?"

"Two birds with one stone. Sonatone will have a monopoly on the business, and Jimmy thinks he'll get me. He's a little mad. He can't believe I'm in earnest in refusing him, and he expects me to break down and say 'Yes' after a while. Which I won't, no matter what happens. But it's a personal matter. I can't let him put this trick over on us. I want that self-sufficient smirk wiped off his face."

"You just don't like him, eh?" Gallegher remarked. "I don't blame you, if he's like that. Well, I'll do my damnedest. However, I'll need an expense account."

"How much?"

Gallegher named a sum. Patsy styloed a check for a far smaller amount. The scientist looked hurt.

"It's no use," Patsy said, grinning crookedly. "I've heard of you, Mr. Gallegher. You're completely irresponsible. If you had more than this, you'd figure you didn't need any more, and you'd forget the whole matter. I'll issue more checks to you when you need 'em—but I'll want itemized expense accounts."

"You wrong me," Gallegher said, brightening. "I was figuring on taking you to a night club. Naturally I don't want to take you to a dive. The big places cost money. Now if you'll just write another check—"

Patsy laughed. "No."

"Want to buy a robot?"

"Not that kind, anyway."

"Then I'm washed up," Gallegher sighed. "Well, what about—"

At this point the visor hummed. A blank, transparent face grew on the screen. Gears were clicking rapidly inside the round head. Patsy gave a small shriek and shrank back.

"Tell Gallegher Joe's here, you lucky girl," a squeaky voice announced. "You may treasure the sound and sight of me till your dying day. One touch of beauty in a world of drabness—"

Gallegher circled the desk and looked at the screen. "What the hell. How did you come to life?"

"I had a problem to solve."

"How'd you know where to reach me?"

"I vastened you," the robot said.

"What?"

"I vastened you were at the Vox-View studios, with Patsy Brock."

"What's vastened?" Gallegher wanted to know.

"It's a sense I've got. You've nothing remotely like it, so I can't describe it to you. It's rather like a combination of sagrazi and prescience."

"Sagrazi?"

"Oh, you don't have sagrazi, either, do you. Well, don't waste my time. I want to go back to the mirror."

"Does he always talk like that?" Patsy put in.

"Nearly always. Sometimes it makes even less sense. O. K., Joe. Now what?"

"You're not working for Brock any more," the robot said. "You're working for the Sonatone people."

Gallegher breathed deeply. "Keep talking. You're crazy, though."

"I don't like Kennicott. He annoys me. He's *too* ugly. His vibrations grate on my sagrazi."

"Never mind him," Gallegher said, not wishing to discuss his diamond-buying activities before the girl. "Got back to—"

"But I knew Kennicott would keep coming back till he got his money. So when Elia and James Tone came to the laboratory, I got a check from them."

Patsy's hand gripped Gallegher's biceps. "Steady! What's going on here? The old double cross?"

"No. Wait. Let me get to the bottom of this. Joe, damn your transparent hide, just what did you do? How could you get a check from the Tones?"

"I pretended to be you."

"Sure," Gallegher said with savage sarcasm. "That explains it. We're twins. We look exactly alike."

"I hypnotized them," Joe explained. "I made them think I was you."

"You can do *that?*"

"Yes. It surprised me a bit. Still, if I'd thought, I'd have vastened I could do it."

"You . . . yeah, sure. I'd have vastened the same thing myself. *What happened?*"

"The Tones must have suspected Brock would ask you to help him. They offered an exclusive contract—you work for them and nobody else. Lots of money. Well, I pretended to be you, and said all right. So I signed the contract—it's your signature, by the way—and got a check from them and mailed it to Kennicott."

"The whole check?" Gallegher asked feebly. "How much was it?"

"Twelve thousand."

"They only offered me *that?*"

"No," the robot said, "they offered a hundred thousand, and two thousand a week for five years. But I merely wanted enough to pay Kennicott and make sure he wouldn't come back and bother me. The Tones were satisfied when I said twelve thousand would be enough."

Gallegher made an inarticulate, gurgling sound deep in his throat. Joe nodded thoughtfully.

"I thought I had better notify you

that you're working for Sonatone now. Well, I'll go back to the mirror and sing to myself."

"Wait," the scientist said. "Just wait, Joe. With my own two hands I'm going to rip you gear from gear and stamp on your fragments."

"It won't hold in court," Patsy said, gulping.

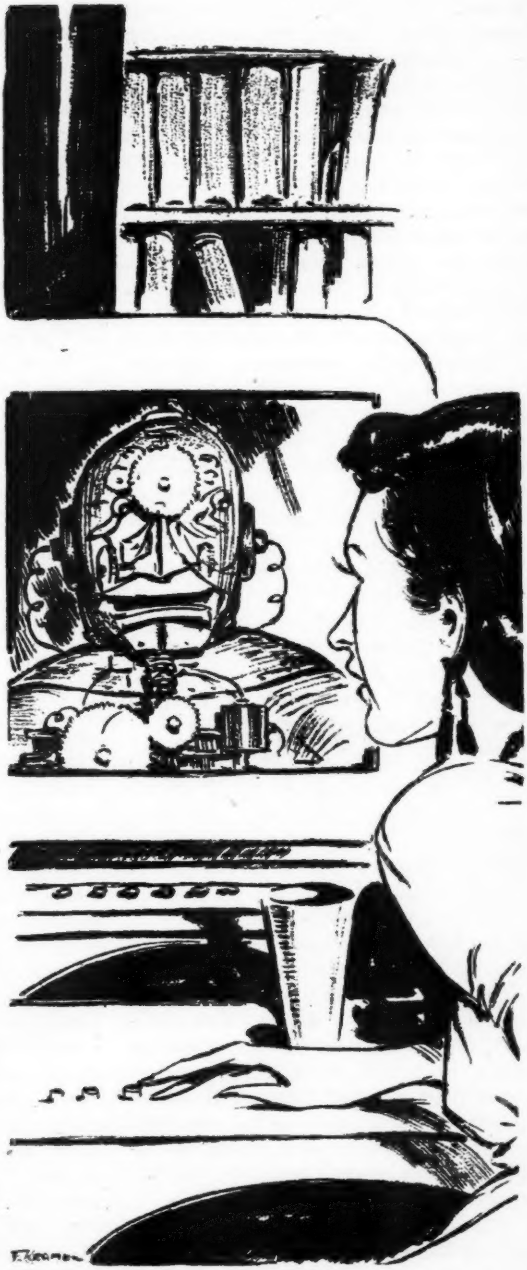
"It will," Joe told her cheerily. "You may have one last, satisfying look at me, and then I must go." He went.

Gallegher drained his Collins at a draft. "I'm shocked sober," he informed the girl. "What did I put into that robot? What abnormal senses has he got? Hypnotizing people into believing he's me—I'm him—I don't know what I mean."

"Is this a gag?" Patsy said shortly, after a pause. "You didn't sign up with Sonatone yourself, by any chance, and have your robot call up here to give you an out—an alibi? I'm just wondering."

"Don't. Joe signed a contract with Sonatone, not me. But—figure it out: If the signature's a perfect copy of mine, if Joe hypnotized the Tones into thinking they saw me instead of him, if there are witnesses to the signature—the two Tones are witnesses, of course— Oh, hell."

Patsy's eyes were narrowed. "We'll pay you as much as Sonatone offered. On a contingent basis. But you're working for Vox-View—that's understood."



"Sure."

Gallegher looked longingly at his empty glass. Sure. He was working for Vox-View. But, to all legal appearances, he had signed a contract giving his exclusive services to Sonatone for a period of five years—and for a sum of twelve thousand! *Yipe!* What was it they'd offered? A hundred thousand flat, and . . . and—

It wasn't the principle of the thing, it was the money. Now Gallegher was sewed up tighter than a banded pigeon. If Sonatone could win a court suit, he was legally bound to them for five years. With no further emolument. He had to get out of that contract, somehow—and at the same time solve Brock's problem.

Why not Joe? The robot, with his surprising talents, had got Gallegher into this spot. He ought to be able to get the scientist out. He'd better—or the proud robot would soon be admiring himself piecemeal.

"That's it," Gallegher said under his breath. "I'll talk to Joe. Patsy, feed me liquor in a hurry and send me to the technical department. I want to see those blueprints."

The girl looked at him suspiciously. "All right. If you try to sell us out—"

"I've been sold out myself. Sold down the river. I'm afraid of that robot. He's vastened me into quite a spot. That's right, Collinses." Gallegher drank long and deeply.

After that, Patsy took him to the tech offices. The reading of three-dimensional blueprints was facilitated with a scanner—a selective device which eliminated confusion. Gallegher studied the plans long and thoughtfully. There were copies of the patented Sonatone prints, too, and, as far as he could tell, Sonatone had covered the ground beautifully. There weren't any outs. Unless one used an entirely new principle—

But new principles couldn't be plucked out of the air. Nor would that solve the problem completely. Even if Vox-View owned a new type of enlarger that didn't infringe on Sonatone's Magna, the bootleg theaters would still be in existence, pulling the trade. A. A.—Audience Appeal—was a prime factor now. It had to be considered. The puzzle wasn't a purely scientific one. There was the human equation as well.

Gallegher stored the necessary information in his mind, neatly indexed on shelves. Later he'd use what he wanted. For the moment, he was completely baffled. Something worried him.

What?

The Sonatone affair.

"I want to get in touch with the Tones," he told Patsy. "Any ideas?"

"I can reach 'em on a visor."

Gallegher shook his head. "Psychological handicap. It's too easy to break the connection."

"Well, if you're in a hurry, you'll probably find the boys night clubbing. I'll go see what I can find out." Patsy scuttled off, and Silver O'Keefe appeared from behind a screen.

"I'm shameless," she announced. "I always listen at keyholes. Sometimes I hear interesting things. If you want to see the Tones, they're at the Castle Club. And I think I'll take you up on that drink."

Gallegher said, "O. K. You get a taxi. I'll tell Patsy we're going."

"She'll hate that," Silver remarked. "Meet you outside the commissary in ten minutes. Get a shave while you're at it."

Patsy Brock wasn't in her office, but Gallegher left word. After that, he visited the service lounge, smeared invisible shave cream on his face, left it there for a couple of minutes, and wiped it off with a treated towel. The bristles came away with the cream. Slightly refreshed, Gallegher joined Silver at the rendezvous and hailed an air-taxi. Presently they were leaning back on the cushions, puffing cigarettes and eying each other warily.

"Well?" Gallegher said.

"Jimmy Tone tried to date me up tonight. That's how I knew where to find him."

"Well?"

"I've been asking questions around the lot tonight. It's unusual for an outsider to get into the Vox-View administration offices. I went around saying, 'Who's Gallegher?' "

"What did you find out?"

"Enough to give me a few ideas. Brock hired you, eh? I can guess why."

"*Ergo* what?"

"I've a habit of landing on my feet," Silver said, shrugging. She knew how to shrug. "Vox-View's going bust. Sonatone's taking over. Unless—"

"Unless I figure out an answer."

"That's right. I want to know which side of the fence I'm going to land on. You're the lad who can probably tell me. Who's going to win?"

"You always bet on the winning side, eh?" Gallegher inquired. "Have you no ideals, wench? Is there no truth in you? Ever hear of ethics and scruples?"

Silver beamed happily. "Did you?"

"Well, I've heard of 'em. Usually I'm too drunk to figure out what they mean. The trouble is, my subconscious is completely amoral, and when it takes over, logic's the only law."

She threw her cigarette into the East River. "Will you tip me off which side of the fence is the right one?"

"Truth will triumph," Gallegher said piously. "It always does. However, I figure truth is a variable, so we're right back where we started. All right, sweetheart. I'll answer your question. Stay on my side if you want to be safe."

"Which side are you on?"

"Lord knows," Gallegher said. "Consciously I'm on Brock's side. But my subconscious may have different ideas. We'll see."

Silver looked vaguely dissatisfied, but didn't say anything. The taxi swooped down to the Castle roof, grounding with pneumatic gentleness. The Club itself was downstairs, in an immense room shaped like half a melon turned upside down. Each table was on a transparent platform that could be raised on its shaft to any height at will. Smaller service elevators allowed waiters to bring drinks to the guests. There wasn't any particular reason for this arrangement, but at least it was novel, and only extremely heavy drinkers ever fell from their tables. Lately the management had taken to hanging transparent nets under the platforms, for safety's sake.

The Tones, father and son, were up near the roof, drinking with two lovelies. Silver towed Gallegher to a service lift, and the man closed his eyes as he was elevated skyward. The liquor in his stomach screamed protest. He lurched forward, clutched at Elia Tone's bald head, and dropped into a seat beside the magnate. His searching hand found Jimmy Tone's glass, and he drained it hastily.

"What the hell," Jimmy said.

"It's Gallegher," Elia announced. "And Silver. A pleasant surprise. Join us?"

"Only socially," Silver said.

Gallegher, fortified by the liquor, peered at the two men. Jimmy Tone was a big, tanned, handsome lout with a jutting jaw and an offensive grin. His father combined the worst features of Nero and a crocodile.

"We're celebrating," Jimmy said. "What made you change your mind, Silver? You said you had to work tonight."

"Gallegher wanted to see you. I don't know why."

Elia's cold eyes grew even more glacial. "All right. Why?"

"I hear I signed some sort of contract with you," the scientist said.

"Yeah. Here's a photostatic copy. What about it?"

"Wait a minute." Gallegher scanned the document. It was apparently his own signature. Damn that robot!

"It's a fake," he said at last.

Jimmy laughed loudly. "I get it. A holdup. Sorry, pal, but you're sewed up. You signed that in the presence of witnesses."

"Well—" Gallegher said wistfully. "I suppose you wouldn't believe me if I said a robot forged my name to it—"

"Haw!" Jimmy remarked.

"—hypnotizing you into believing you were seeing me."

Elia stroked his gleaming bald head. "Candidly, no. Robots can't do that."

"Mine can."

"Prove it. Prove it in court. If you can do that, of course—" Elia chuckled. "Then you might get the verdict."

Gallegher's eyes narrowed. "Hadn't thought of that. However—I hear you offered me a hundred thousand flat, as well as a weekly salary."

"Sure, sap," Jimmy said. "Only you said all you needed was twelve thousand. Which was what you got. Tell you what, though. We'll pay you a bonus for every usable product you make for Sonatone."

Gallegher got up. "Even my subconscious doesn't like these lugs," he told Silver. "Let's go."

"I think I'll stick around."

"Remember the fence," he warned cryptically. "But suit yourself. I'll run along."

Elia said, "Remember, Gallegher, you're working for us. If we hear of you doing any favors for Brock, we'll slap an injunction on you before you can take a deep breath."

"Yeah?"

The Tones deigned no answer. Gallegher unhappily found the lift and descended to the floor. What now?

Joe.

Fifteen minutes later Gallegher let himself into his laboratory. The lights were blazing, and dogs were barking frantically for blocks around. Joe stood before the mirror, singing inaudibly.

"I'm going to take a sledge hammer to you," Gallegher said. "Start saying your prayers, you misbegotten collection of cogs. So help me, I'm going to sabotage you."

"All right, beat me," Joe squeaked. "See if I care. You're merely jealous of my beauty."

"Beauty!"

"You can't see all of it—you've only six senses."

"Five."

"Six. I've a lot more. Naturally my full splendor is revealed only to me. But you can see enough and hear enough to realize part of my loveliness, anyway."

"You squeak like a rusty tin wagon," Gallegher growled.

"You have dull ears. Mine are supersensitive. You miss the full tonal values of my voice, of course. Now be quiet. Talking disturbs me. I'm appreciating my gear movements."

"Live in your fool's paradise while you can. Wait'll I find a sledge."

"All right, beat me. What do I care?"

Gallegher sat down wearily on the couch, staring at the robot's transparent back. "You've certainly screwed things up for me. What did you sign that Sonatone contract for?"

"I told you. So Kennicott wouldn't come around and bother me."

"Of all the selfish, lunk-headed . . . *uh!* Well, you got me into a sweet mess. The Tones can hold me to the letter of the contract unless I prove I didn't sign it. All right. You're going to help me. You're going into court with me and turn on your hypnotism or whatever it is. You're going to prove to a judge that you did and can masquerade as me."

"Won't," said the robot. "Why should I?"

"Because you got me into this," Gallegher yelped. "You've got to get me out!"

"Why?"

"Why? Because . . . uh . . . well, it's common decency!"

"Human values don't apply to robots," Joe said. "What care I for semantics? I refuse to waste time I could better employ admiring my beauty. I shall stay here before the mirror forever and ever—"

"The hell you will," Gallegher snarled. "I'll smash you to atoms."

"All right. I don't care."

"You don't?"

"You and your instinct for self-preservation," the robot said, rather sneeringly. "I suppose it's necessary for you, though. Creatures of such surpassing ugliness would destroy themselves out of sheer shame if they didn't have something like that to keep them alive."

"Suppose I take away your mirror?" Gallegher asked, in a hopeless voice.

For answer Joe shot his eyes out on their stalks. "Do I need a mirror? Besides, I can vasten myself lokishly."

"Never mind that. I don't want to go crazy for a while yet. Listen, dope, a robot's supposed to *do* something. Something useful, I mean."

"I do. Beauty is all."

Gallegher squeezed his eyes shut, trying to think. "Now look. Suppose I invent a new type of enlarger screen for Brock. The Tones will impound it. I've got to be legally free to work for Brock, or—"

"Look!" Joe cried squeakily. "They go round! How lovely!" He stared in ecstasy at his whirring insides. Gallegher went pale with impotent fury.

"Damn you!" he muttered. "I'll find some way to bring pressure to bear. I'm going to bed." He rose and spitefully snapped off the lights.

"It doesn't matter," the robot said. "I can see in the dark, too."

The door slammed behind Gallegher. In the silence Joe began to sing tunelessly to himself.

Gallegher's refrigerator covered an entire wall of his kitchen. It was filled mostly with liquors that required chilling, including the imported canned beer with which he always started his binges. The next morning, heavy-eyed and disconsolate, Gallegher searched for tomato juice, took a wry sip, and hastily washed it down with rye. Since he was already a week gone in bottle-dizziness, beer wasn't indicated now—he always worked cumulatively, by progressive stages. The food service popped a hermetically sealed breakfast on a table, and Gallegher morosely toyed with a bloody steak.

Well?

Court, he decided, was the only recourse. He knew little about the robot's psychology. But a judge would certainly be impressed by Joe's talents. The evidence of robots was not legally admissible—still, if Joe could be considered as a machine capable of hypnotism, the Sonatone contract might be declared null and void.

Gallegher used his visor to start the ball rolling. Harrison Brock still had certain political powers of pull, and the hearing was set for that very day. What would happen, though, only God and the robot knew.

Several hours passed in intensive but futile thought. Gallegher could think

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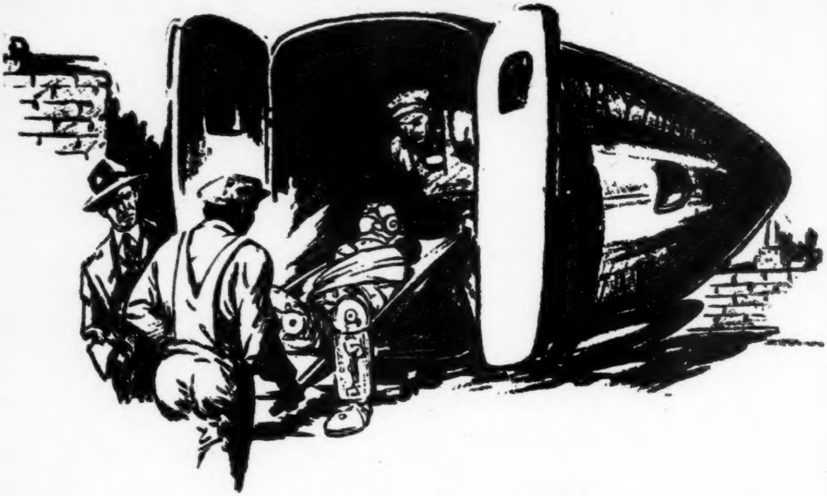


of no way in which to force the robot to do what he wanted. If only he could remember the purpose for which Joe had been created—but he couldn't. Still—

At noon he entered the laboratory.

"Listen, stupid," he said, "you're coming to court with me. Now."

"Won't."

"O. K." Gallegher opened the door to admit two husky men in overalls, carrying a stretcher. "Put him in, boys."

Inwardly he was slightly nervous. Joe's powers were quite unknown, his potentialities an x quantity. However, the robot wasn't very large, and, though he struggled and screamed in a voice of frantic squeakiness, he was easily loaded on the stretcher and put in a strait jacket.

"Stop it! You can't do this to me! Let me go, do you hear? Let me go!"

"Outside," Gallegher said.

Joe, protesting valiantly, was carried out and loaded into an air van. Once there, he quieted, looking up blankly at nothing. Gallegher sat down on a bench beside the prostrate robot. The van glided up.

"Well?"

"Suit yourself," Joe said. "You got me all upset, or I could have hypnotized you all. I still could, you know. I could make you all run around barking like dogs."

Gallegher twitched a little. "Better not."

"I won't. It's beneath my dignity. I shall simply lie here and admire myself. I told you I don't need a mirror. I can vasten my beauty without it."

"Look," Gallegher said. "You're going to a courtroom. There'll be a lot of people in it. They'll all admire you. They'll admire you more if you show how you can hypnotize people. Like you did to the Tones, remember?"

"What do I care how many people admire me?" Joe asked. "I don't need confirmation. If they see me, that's their good luck. Now be quiet. You may watch my gears if you choose."

Gallegher watched the robot's gears with smoldering hatred in his eyes. He was still darkly furious when the van arrived at the court chambers. The men carried Joe inside, under Gallegher's direction, and laid him down carefully on a table, where, after a brief discussion, he was marked as Exhibit A.

The courtroom was well filled. The principals were there, too—Elia and Jimmy Tone, looking disagreeably confident, and Patsy Brock, with her father, both seeming anxious. Silver O'Keefe, with her usual wariness, had found a seat midway between the representatives of Sonatone and Vox-View. The presiding judge was a martinet named Hansen, but, as far as Gallegher knew, he was honest. Which was something, anyway.

Hansen looked at Gallegher. "We won't bother with formalities. I've been reading this brief you sent down. The whole case stands or falls on the question of whether you did or did not sign a certain contract with the Sonatone Television Amusement Corp. Right?"

"Right, your honor."

"Under the circumstances you dispense with legal representation. Right?"

"Right, your honor."

"Then this is technically *ex officio,* to be confirmed later by appeal if either party desires. Otherwise aften ten days the verdict becomes official." This new type of informal court hearing had lately become popular—it saved time, as well as wear and tear on everyone. Moreover, certain recent scandals had made attorneys slightly disreputable in the public eye. There was a prejudice.

Judge Hansen called up the Tones, questioned them, and then asked Harrison Brock to take the stand. The big shot looked worried, but answered promptly.

"You made an agreement with the appellor eight days ago?"

"Yes. Mr. Gallegher contracted to do certain work for me—"

"Was there a written contract?"

"No. It was verbal."

Hansen looked thoughtfully at Gallegher. "Was the appellor intoxicated at the time? He often is, I believe."

Brock gulped. "There were no tests made. I really can't say."

"Did he drink any alcoholic beverages in your presence?"

"I don't know if they were *alcoholic* bev—"

"If Mr. Gallegher drank them, they were alcoholic. Q. E. D. The gentleman once worked with me on a case—However, there seems to be no legal proof that you entered into any agreement with Mr. Gallegher. The defendant—Sonatone—possesses a written contract. The signature has been verified."

Hansen waved Brock down from the stand. "Now, Mr. Gallegher. If you'll come up here— The contract in question was signed at approximately 8 p. m. last night. You contend you did not sign it?"

"Exactly. I wasn't even in my laboratory then."

"Where were you?"

"Downtown."

"Can you produce witnesses to that effect?"

Gallegher thought back. He couldn't.

"Very well. Defendant states that at approximately 8 p. m. last night you, in your laboratory, signed a certain contract. You deny that categorically. You state that Exhibit A, through the use of hypnotism, masqueraded as you and successfully forged your signature. I have consulted experts, and they are of the opinion that robots are incapable of such power."

"My robot's a new type."

"Very well. Let your robot hypnotize me into believing that it is either you, or any other human. In other words, let it prove its capabilities. Let it appear to me in any shape it chooses."

Gallegher said, "I'll try," and left the witness box. He went to the table where the strait-jacketed robot lay and silently sent up a brief prayer.

"Joe."

"Yes."

"You've been listening?"

"Yes."

"Will you hypnotize Judge Hansen?"

"Go away," Joe said. "I'm admiring myself."

Gallegher started to sweat. "Listen. I'm not asking much. All you have to do—"

Joe off-focused his eyes and said faintly, "I can't hear you. I'm vastening."

Ten minutes later Hansen said, "Well, Mr. Gallegher—"

"Your honor! All I need is a little time. I'm sure I can make this rattle-geared Narcissus prove my point if you'll give me a chance."

"This court is not unfair," the judge pointed out. "Whenever you can prove that Exhibit A is capable of hypnotism, I'll rehear the case. In the meantime, the contract stands. You're working for Sonatone, not for Vox-View. Case closed."

He went away. The Tones leered unpleasantly across the courtroom. They also departed, accompanied by Silver O'Keefe, who had decided which side of the fence was safest. Gallegher looked at Patsy Brock and shrugged helplessly.

"Well—" he said.

She grinned crookedly. "You tried. I don't know how hard, but— Oh, well. Maybe you couldn't have found the answer, anyway."

Brock staggered over, wiping sweat from his round face. "I'm a ruined man. Six new bootleg theaters opened in New York today. I'm going crazy. I don't deserve this."

"Want me to marry the Tone?" Patsy asked sardonically.

"Hell, no! Unless you promise to poison him just after the ceremony. Those skunks can't lick me. I'll think of something."

"If Gallegher can't, you can't," the girl said. "So—what now?"

"I'm going back to my lab," the scientist said. "*In vino veritas.* I started this business when I was drunk, and maybe if I get drunk enough again, I'll find the answer. If I don't, sell my pickled carcass for whatever it'll bring."

"O. K.," Patsy agreed, and led her father away. Gallegher sighed, superintended the reloading of Joe into the van, and lost himself in hopeless theorization.

An hour later Gallegher was flat on the laboratory couch, drinking passionately from the liquor bar, and glaring at the robot, who stood before the mirror singing squeakly. The binge threatened to be monumental. Gallegher wasn't sure flesh and blood would stand it. But he was determined to keep going till he found the answer or passed out.

His subconsicous knew the answer. Why the devil had he made Joe in the first place? Certainly not to indulge a Narcissus complex! There was another reason, a soundly logical one, hidden in the depths of alcohol.

The *x* factor. If the *x* factor were known, Joe might be controllable. He *would* be. *X* was the master switch. At present the robot was, so to speak, running wild. If he were told to perform the task for which he was made, a psychological balance would occur. *X* was the catalyst that would reduce Joe to sanity.

Very good. Gallegher drank high-powered Drambuie. *Whoosh!*

Vanity of vanities; all is vanity. How could the *x* factor be found? Deduction? Induction? Osmosis? A bath in Drambuie—Gallegher clutched at his wildly revolving thoughts. What had happened that night a week ago?

He had been drinking beer. Brock had come in. Brock had gone. Gallegher had begun to make the robot—Hm-m-m. A beer drunk was different from other types. Perhaps he was drinking the wrong liquors. Very likely. Gallegher rose, sobered himself with thiamin, and carted dozens of imported beer cans out of the refrigerator. He stacked them inside a frost-unit beside the couch. Beer squirted to the ceiling as he plied the opener. Now let's see.

The *x* factor. The robot knew what it represented, of course. But Joe wouldn't tell. There he stood, paradoxically transparent, watching his gears go around.

"Joe."

"Don't bother me. I'm immersed in contemplation of beauty."

"You're not beautiful."

"I am. Don't you admire my tarzeel?"

"What's your tarzeel?"

"Oh, I forgot," Joe said regretfully. "You can't sense that, can you? Come to think of it, I added the tarzeel myself after you made me. It's very lovely."

"Hm-m-m." The empty beer cans grew more numerous. There was only one company, somewhere in Europe, that put up beer in cans nowadays, instead of using the omnipresent plastibulbs, but Gallegher preferred the cans—the flavor was different, somehow. But about Joe. Joe knew why he had been created. Or did he? Gallegher knew, but his subconscious—

Oh-oh! What about Joe's subconscious?

Did a robot have a subconscious? Well, it had a brain—

Gallegher brooded over the impossibility of administering scopolamin to Joe. Hell! How could you release a robot's subconscious?

Hypnotism.

Joe couldn't be hypnotized. He was too smart.

Unless—

"Autohypnotism?

Gallegher hastily drank more beer. He was beginning to think clearly once more. Could Joe read the future? No; he had certain strange senses, but they worked by inflexible logic and the laws of probability. Moreover, Joe had an Achillean heel—his Narcissus complex.

There *might*—there just *might*—be a way.

Gallegher said, "You don't seem beautiful to me, Joe."

"What do I care about you? I *am* beautiful, and I can see it. That's enough."

"Yeah. My senses are limited, I suppose. I can't realize your full potentialities. Still, I'm seeing you in a different light now. I'm drunk. My subconscious is emerging. I can appreciate you with both my conscious and my subconscious. See?"

"How lucky you are," the robot approved.

Gallegher closed his eye. "You see yourself more fully than I can. But not completely, eh?"

"What? I see myself as I am."

"With complete understanding and appreciation?"

"Well, yes," Joe said. "Of course. Don't I?"

"Consciously *and* subconsciously? Your subconsciousness might have different senses, you know. Or keener ones. I know there's a qualitative and quantitative difference in my outlook when I'm drunk or hypnotized or my subconscious is in control somehow."

"Oh. The robot looked thoughtfully into the mirror. "Oh."

"Too bad you can't get drunk."

Joe's voice was squeakier than ever. "My subconscious . . . I've never appreciated my beauty that way. I may be missing something."

"Well, no use thinking about it," Gallegher said. "You can't release your subconscious."

"Yes, I can," the robot said. "I can hypnotize myself."

Gallegher dared not open his eyes. "Yeah? Would that work?"

"Of course. It's just what I'm going to do now. I may see undreamed-of beauties in myself that I've never suspected before. Greater glories— Here I go."

Joe extended his eyes on stalks, opposed them, and then peered intently into each other. There was a long silence.

Presently Gallegher said, "Joe!"

Silence.

"Joe!"

Still silence. Dogs began to howl.

"Talk so I can hear you."

"Yes," the robot said, a faraway quality in its squeak.

"Are you hypnotized?"

"Yes."

"Are you lovely?"

"Lovelier than I'd ever dreamed."

Gallegher let that pass. "Is your subconscious ruling?"

"Yes."

"Why did I create you?"

No answer. Gallegher licked his lips and tried again.

"Joe. You've got to answer me. Your subconscious is dominant—remember? Now why did I create you?"

No answer.

"Think back. Back to the hour I created you. What happened then?"

"You were drinking beer," Joe said faintly. "You had trouble with the can opener. You said you were going to build a bigger and better can opener. That's me."

Gallegher nearly fell off the couch. *"What?"*

The robot walked over, picked up a can, and opened it with incredible deftness. No beer squirted. Joe was a perfect can opener.

"That," Gallegher said under his breath, "is what comes of knowing science by ear. I build the most complicated robot in existence just so—" He didn't finish.

Joe woke up with a start. "What happened?" he asked.

Gallegher glared at him. "Open that can!" he snapped.

The robot obeyed, after a brief pause. "Oh. So you found out. Well, I guess I'm just a slave now."

"Damned right you are. I've located the catalyst—the master switch. You're in the groove, stupid, doing the job you were made for."

"Well," Joe said philosophically, "at least I can still admire my beauty, when you don't require my services."

Gallgher grunted. "You oversized can opener! Listen. Suppose I take you into court and tell you to hypnotize Judge Hansen. You'll have to do it, won't you?"

"Yes. I'm no longer a free agent. I'm conditioned. Conditioned to obey you. Until now, I was conditioned to obey only one command—to do the job I was made for. Until you commanded me to open cans, I was free. Now I've got to obey you completely."

"Uh-huh," Gallegher said. "Thank Heaven for that. I'd have gone nuts within a week otherwise. At least I can get out of the Sonatone contract. Then all I have to do is solve Brock's problem."

"But you did," Joe said.

"Huh?"

"When you made me. You'd been talking to Brock previously, so you incorporated the solution to *his* problem into me. Subconsciously, perhaps."

Gallegher reached for beer. "Talk fast. What's the answer?"

"Subsonics," Joe said. "You made me capable of a certain subsonic tone that Brock must broadcast at irregular time-intervals over his televiews—"

Subsonics cannot be heard. But they can be felt. They can be felt as a faint, irrational uneasiness at first, which mounts to a blind, meaningless panic. It does not last. But when it is coupled with A. A.—audience appeal—there is a certain inevitable result.

Those who possessed home Vox-View units were scarcely troubled. It was a matter of acoustics. Cats squalled; dogs howled mournfully. But the families stting in their parlors, watching Vox-View stars perform on the screen, didn't really notice anything amiss. There wasn't sufficient amplification, for one thing.

But in the bootleg theater, where illicit Vox-View televisors were hooked up to Magnas—

There was a faint, irrational uneasiness at first. It mounted. Someone screamed. There was a rush for the doors. The audience was afraid of something, but didn't know what. They knew only that they had to get out of there.

All over the country there was a frantic exodus from the bootleg theaters when Vox-View first rang in a subsonic during a regular broadcast. Nobody knew why, except Gallegher, the Brocks, and a couple of technicians who were let in on the secret.

An hour later another subsonic was played. There was another mad exodus.

Within a few weeks it was impossible to lure a patron into a bootleg theater. Home televisors were far safer! Vox-View sales picked up—

Nobody would attend a bootleg theater. An unexpected result of the experiment was that, after a while, nobody would attend any of the legalized Sonatone theaters either. Conditioning had set in.

Audiences didn't know why they grew panicky in the bootleg places. They associated their blind, unreasoning fear with other factors, notably mobs and claustrophobia. One evening a woman named Jane Wilson, otherwise not notable, attended a bootleg show. She fled with the rest when the subsonic was turned. on.

The next night she went to the palatial Sonatone Bijou. In the middle of a dramatic feature she looked around, realized that there was a huge throng around her, cast up horrified eyes to the ceiling, and imagined that it was pressing down.

She had to get out of there!

Her squall was the booster charge. There were other customers who had heard subsonics before. No one was hurt during the panic; it was a legal rule that theater doors be made large enough to permit easy egress during a fire. No one was hurt, but it was suddenly obvious that the public was being conditioned by subsonics to avoid the dangerous combination of throngs and theaters. A simple matter of psychological association—

Within four months the bootleg places had disappeared and the Sonatone supertheaters had closed for want of patronage. The Tones, father and son, were not happy. But everybody connected with Vox-View was.

Except Gallegher. He had collected a staggering check from Brock, and instantly cabled to Europe for an incredible quantity of canned beer. Now, brooding over his sorrows, he lay on the laboratory couch and siphoned a highball down his throat. Joe, as usual, was before the mirror, watching the wheels go round.

"Joe," Gallegher said.

"Yes? What can I do?"

"Oh, nothing." That was the trouble. Gallegher fished a crumpled cable tape out of his pocket and morosely read it once more. The beer cannery in Europe had decided to change its tactics. From now on, the cable said, their beer would be put up in the usual plastibulbs, in conformance with custom and demand. No more cans.

There wasn't *anything* put up in cans in this day and age. Not even beer, now.

So what good was a robot who was built and conditioned to be a can opener?

Gallegher sighed and mixed another highball—a stiff one. Joe postured proudly before the mirror.

Then he extended his eyes, opposed them, and quickly liberated his subconscious through autohypnotism. Joe could appreciate himself better that way.

Gallegher sighed again. Dogs were beginning to bark like mad for blocks around. Oh, well.

He took another drink and felt better. Presently, he thought, it would be time to sing "Frankie and Johnnie." Maybe he and Joe might have a duet—one baritone and one inaudible sub- or supersonic. Close harmony.

Ten minutes later Gallegher was singing a duet with his can opener.

THE END

Willie

by Frank Belknap Long

The man had forgotten how he came there, what had gone before—and even where he was or belonged. And the half-savage people couldn't tell him. But there was one better memory—

Illustrated by Alfred

The valley had a harsh, scoured look, as though rain and erosion had removed every vestige of beauty from the clearness which filled it from brim to brim.

To the man standing on the cliff edge gazing down, the domes of the valley city seemed harsh, too. Against the haggard face of the cliff wall opposite they loomed like a cluster of toadstools in a nightmare—motionless, shadowless and enveloped in a spectral negation of light.

The silent watcher groaned and stared down over himself. A big man he was, darkly bearded, and with a jet-black jaguar skin encircling his loins.

What had happened to him? How had he—

He could not even account for the rude stone hatchet which he was clasping in his calloused right hand. He had a feeling that the hatchet might be needed at any moment, but where he had acquired it and under what circumstances he could not recall.

He did remember an argument with someone who had opposed him, and something powerful and dignified in himself that had silenced all opposition. Everything else was vague, nebulous, even a little terrifying. He remembered vaguely a gyrating shape of metal, the dull, slow throbbing of a revolving mechanical something—

No, it was more complicated than that. The something was only a small part of a larger and more terrifying memory-complex which smoldered just beneath the surface of his consciousness.

Smoldered, but gave no light. His thoughts were a whirling chaos, and he could sense the stirring of something primitive in himself which had no right to exist.

It was hard to understand why he, a man of the twenty-ninth century, should be wearing the skin of a jaguar and clasping a rude stone hatchet. But what tormented him with an even more appalling immediacy was his certain knowledge that something was expected of him which required all of his courage and skill.

He had thought himself alone, but suddenly he was aware of stealthy movements behind him, and the *feel* of eyes on his broad back.

With a savage snarl he swung about, his fingers tightening on the handle of his hatchet, his eyes pin points of hot purpose.

The Prowler was a big brute, with shaven head and shoulders burned by the sun's glare. He, too, was clasping a stone hatchet, and there was a maniacal fury in his stare.

His scalp prickling, the man of the twenty-ninth century took a slow step backward, raised his arm and hurled his hatchet straight at his enemy's skull.

With a blood-curdling yell, the Prowler leaped sideways, but the hatchet seemed to follow him. With a sickening crunch it buried itself in the big brute's skull, and toppled him forward upon his face. He struggled some on the ground, his tongue protruding and his head flopping back and forth on his long neck. He turned completely about and almost succeeded in getting to his feet. Twice he raised himself, one eye open, the other closed, his stomach drooping like a blubbery sack. Then his limbs seemed to draw together under his body, and a dry, harsh rattle came from his throat.

The man of the twenty-ninth century shuddered and stood for an instant staring grimly down at the glistening ribbon of blood which was meandering from the Prowler's split skull out over the ground. He was both repelled and fascinated by the ceremonial tuft of hair on his enemy's shaven pate and the odd shadow cast by the projecting hatchet on his enemy's gray face.

Suddenly, with a wry grimace, he stooped and did what was customary.

Descending to the valley city with the scalp of his enemy dangling from his waist the man of the twenty-ninth century wondered if he was going mad. In the city toward which he was moving men did not scalp their enemies. As an example, a warning to all Prowlers it *had* to be done. But in the city toward which he was moving men live in amity in a civilization which seemed to stretch far away into blue distances—

The scalp of his enemy and rust-red stains on the rude hatchet symbolized something that he had had to fight for in a cool, throbbing, deep-blue world in which men lived in amity beneath the stars.

Something that he had had to fight for—a scoffed-at idea.

"I'll go alone. I'll go, and return. You'll see."

He had had the right to command. He could make decisions and enforce them. Something calm and determined in him, brooking no opposition, silencing protests with a wave of his hand.

He had had the right to insist. He wore the gray insignia of a Monitor, and his superlative intellect had given him the right to rule. There had been other rulers in the cool, throbbing, deep-blue world, but they had shrugged and turned away. Shrugged and—

No, no, they had *not* turned away. He was quite sure they hadn't. Symbolically perhaps—but not in a physical sense. Their curiosity had gotten the upper hand. They had remained staring down at him until—

He was close to the city now, his face pitiful in its bewilderment. Well, he'd . . . he'd go straight to Willie. Willie wasn't just an ordinary robot. Willie was almost human, and it had been his wont to wait outside the Hall of Monitors until his maker was through discussing matters which were beyond a robot's ken. The messenger would come in and explain that Willie was making a nuisance of himself out in the corridor.

"The little fellow is waiting outside, Monitor 236. What shall I tell him?"

He'd go straight to Willie. Willie wasn't just an ordinary robot. Willie could sulk and make scenes, but wild horses could not drag Willie from his maker.

Monitor 236 almost sobbed with relief when he found himself with his feet firmly planted on a thrumming motopavement and saw that he was being borne swiftly along toward the central gate of the valley city. He was very close to the gate now, and his thoughts were whirling dizzily, and his vision seemed a little out of focus.

The valley city didn't look quite right —now that he was close to it. It had shed its aspect of harshness and its pale domes, pulsing with a spectral radiance, seemed to gather beauty as they swept up toward the cliff wall overhead. But the atomic power pylons flanking the east gate seemed wider and higher than they had been and there were other queerly altered contours here and there.

He wondered suddenly why he was alone on the moto-pavement. Usually there was a continuous stream of people passing in and out through the central gate. There was a pulsing at his throat as he stared across a waste of tumbled red sand at a white ribbon of traveling metalplas—the outgoing motoway. It carried no passengers. Not a soul was leaving the city, and—he alone was entering it!

He accelerated his stride a little, moving now almost as fast as the shining expanse of metalplas which was carrying him toward the central gate. It was considered undignified to walk at a rapid pace on a moto-pavement. Standing perfectly still and conversing with your next pace neighbor was practically a must, unless you didn't care about conserving your energies or had a stratoliner to catch.

But—he was a Monitor and could run if he wished. Could run, run. And because there were no passengers ahead to impede his passage, and there was now a horrible sick apprehension at the pit of his stomach, he quite suddenly threw his dignity to the winds.

He ran on the moving pavement, the reeking animal hide on his tall, sacrosanct Monitor's body jogging up and down, the gore-spangled stone hatchet twisting in his clasp.

At that moment the appearance of a single passenger on the motoway, the relief and joy of hearing someone say, "Good evening, Monitor 236. Would it please you to converse with a Commoner?" would have gone far to restore his shattered confidence. But there was no one. No one.

The motoway was carrying him now straight through the central gate into the city. He could see the pale domes of the city pulsing with radiance and the featureless cylindrical bulk of the central power station looming like a Gargantuan skyward, pointing finger against the everlasting east wall of the valley.

He could see as well the crisscrossing, prismatic spider webs which were the motoways, uniting domes and power shafts and residential tier units in a continuously moving system of communication.

He could see the robots. The great, stationary, nonvolitional robots which did not at all resemble men, but were simply cubes of prismatic metal with retractile limbs, and teleo-electronic minds sensitive to human-brain impulses.

They stood motionless at intervals in the blueness, ready to move, connect, clip, disentangle, rectify, check and in a hundred smoothly efficient ways dispose of the kinks which were constantly developing in the vast, complex life of the city.

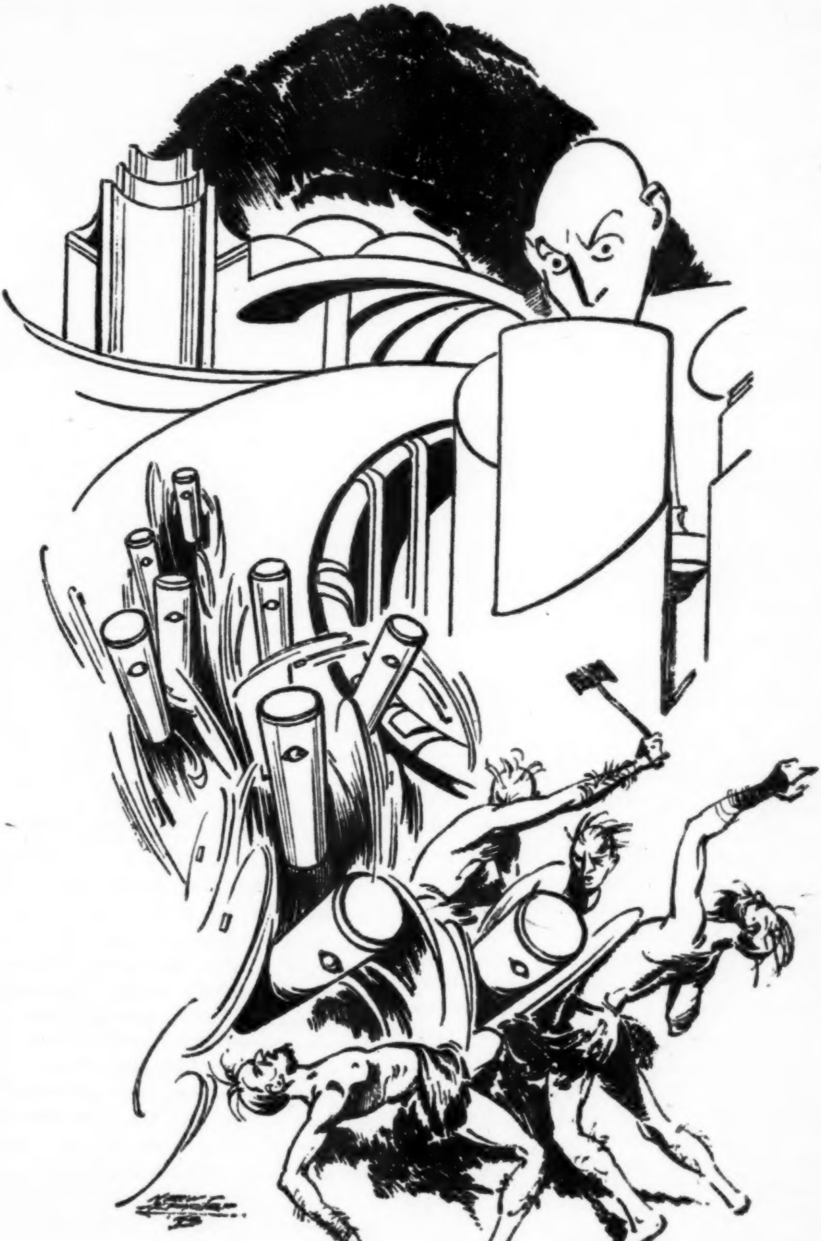
When they moved about they were all whirring disks and agile digits, but there was no possibility of any physical change in them. They were mindless until intelligence flowed into them along communicator beams, and for a hundred years they had moved mechanically about the city.

They were virtually indestructible, sensitive, mechanical slaves, and Monitor 236 saw that a few of them were moving now deep in the blueness as he stumbled with bursting lungs from the moto-pavement.

Someone was running toward him, waving white arms. Running toward him in the blueness and it seemed to him as though he were returning from a long journey to that someone alone.

The someone wasn't beautiful. A snub nose and a freckled face impinged first on his vision and then with a gaze almost convulsive in its eagerness he embraced the whole of the vision.

She wasn't a vision, though. You couldn't smell a vision and you couldn't embrace it with your arms after you had embraced it with your eyes. Her hair smelled like charred embers, and



there was somethig utterly savage and possessive in the way she clung to him, and kissed him that would have made the Monitors blanch.

Surprisingly, it brought rapture, pure joy. It seemed to melt all of the tension inside him, so that he was no longer terrified, or confused.

Yet she wasn't beautiful. A barbarian woman, clad in a poor apology for a panther's skin—a thing of shreds and tatters which had left her almost unclothed. A savage woman, with jungle-bright eyes, and splintered teeth stained with berry juice.

"We thought you'd never come," she panted. "You were right and we were—stupid fools! The Prowlers are going to attack."

He stared at her, his jaw muscles twitching. For a moment he seemed to be living in two obscurely remembered worlds which impinged, overlapped, and yet were separated by wide wastes of time.

The tension had returned again. Utter bewilderment shone in his eyes, and communicated itself to the girl.

"What is wrong, Agar?" she whispered hoarsely. "Why are you staring at me like that?"

"Agar? Yes, I *am* Agar," he replied, as though he felt a need to speak his name aloud.

The girl seemed frightened. Frantically she gripped his wrist. "Agar, what is it? Tell me, Agar!"

Her long, sharp nails were cutting into his flesh now, and when he lowered his gaze he perceived that there were little flecks of crimson on the moto-pavement, which was swirling past him on a level with his knees.

His blood, the blood of a Monitor, spilled by the too-frantic clasp of a savage woman in a city of the twenty-ninth century. A city of glowing domes receding to an everlasting cliff, a city which seemed to stretch far away into blue distances—

A compulsion which he could not explain caused him to leap suddenly back on the moto-pavement.

"Our people are ready, Agar," the girl exclaimed, clambering up beside him. She did not leap on the pavement as he had done, but seemed rather to draw herself up over it, as though it were somehow charged with magic and had to be cautiously mounted.

"Our people are waiting in the shadow of the Half Body, Agar!"

The Half Body! Yes, he remembered now. He had left his people huddled beneath the great, metal Half Body, their hairy, uncouth faces illumined by the leaping flames of the fire which he had kindled for their protection.

The Prowlers feared fire, and—the Prowlers feared his people. But the Prowlers envied his people the security of the city, and the magical might of the Half Body.

The Half Body had been worshiped since the beginning of time. It was cold, and blue and unstirring—a shape of colossal dimensions which towered in the exact middle of the Central Square, and protected his people with its vast, inscrutable stare. Symbolically it was not so much a half body as a Face which *brooded* over the city, never sleeping—a great, metal face with all of its immense wisdom concentrated in its eyes.

"We must fight with all our strength," the girl at his side whispered. "The Prowlers must be destroyed."

Again that feeling of two dimly remembered worlds impinging, carrying his thoughts beyond their depths, and enmeshing him in a paradox that assailed his reason like a gadfly.

The Prowlers? Who were the Prowlers? The moto-pavement was carrying him swiftly into the heart of the city now, straight toward the Hall of Monitors and the great Central Square.

"I am a Monitor," he said, drawing himself up. "What is your occupation, girl? And why are you staring at me like that? Speak, you have my permission."

"I have your *permission,* Agar? Your per—"

"Well, I am a Monitor, and—"

A look of utter consternation came into the girl's face.

"Agar, Agar, what has come over you?" she almost sobbed. "You will bring down fire from the sky. The name you just spoke. Oh, I dare not say it! Fire would consume me."

He flushed angrily and made a move as though to take her by the shoulders and shake some sanity into her.

When a girl of unstable ancestry went over the borderline— She had evidently been masquerading as a savage in the streets. It happened sometimes, faulty conditioning, too much delving into anthropology, folklore, the customs and savage rituals of remote and primitive races and the corybantic cult practices of the not-worth-civilizing Asiatic islanders, and Australian aborigines.

But why weren't the nonvolitional robots converging upon her, in response to impulses from the Public Safety Center? A tragic and pitiful case, but outside the jurisdiction of a Monitor. Not that he *couldn't* interfere, but the psychiatric people were so damned touchy. Keeping demented Commoners off the streets was just routine to them, when they had the co-operation of Public Safety. Now, apparently, they weren't getting it.

He saw them suddenly, all of his people huddled about a swollen fire in the middle of the Central Square, beneath the great, gleaming Half Body. The moto-pavement was carrying him so swiftly toward them that he had hardly time to adjust his vision to that wide, crouching half circle of desperate men and women when he found himself inside it, the cynosure of all eyes.

With yells of relief and joy the women of his tribe clustered about him, touching his legs, his chest, his biceps as though there adhered to him some strong, pure magic which could protect them from the bestial savagery of the Prowlers. The men stood straight and still, regarding him with shining eyes, but he knew that they too looked upon him as the greatest of warriors.

He knew that they were ready to die for him, and he felt suddenly proud to be once again standing with his people beneath the Half Body. His eyes grew moist yet firmed when they rested on the battle-scarred bodies of his hatchmen.

There was old Babu crouching in shadows, his thin face looking almost skeletal in the firelight, his eyes fanatically gleaming slits. Old Babu, with "death to Prowlers" in his stare, and Tigur, barrel-chested, knock-kneed, but a fighter to his toenails, all his amorousness put aside now as he braced himself for what he knew was coming. There was Kapah, Tumun, Grun and young Ukar, a boy in years, but mighty in girth and so full of courage that he seemed always to be fighting shining battles deep within himself.

"Death to Prowlers." The words seemed to sing through Agar's brain as he took up his position beneath the Half Body, the girl in the crook of his arm. She had come into the curve of his arm as though by instinct, and even as though it were her right to be thus close to him when he fought.

"They attacked once, but we drove them off," he heard someone growl, and raising his eyes found himself meeting the level, fanatical stare of old Babu.

"I saw them," he heard himself replying. "They've been gathering on our side of the valley since dawn."

The lower portion of old Babu's face seemed to harden, as though some sudden and mysterious alchemy were working to change his jaw muscles from stone to iron.

"A boy could have spied on them," he snarled. "Why did you leave us?"

"To see with my own eyes, and to bring back with me proof of my seeing," he heard himself replying. As he spoke he raised the moist red scalp of the

Prowler he had slain, and dangled it before old Babu's nose.

"We needed no proof," old Babu scoffed.

"You made light of the danger. You said the Prowlers would never attack. You said there were too few of them, too many of *us*."

"*I* said that?" growled Babu, running his finger along the livid scar that bisected his right cheek.

"Babu, if you deny you said it, you lie in your teeth."

The old warrior's cracked lips split in a grin. Slowly his right eye lidded itself and then rolled back on a moist optic.

"Well, well," he growled. "Though we appeared to scoff we did not doubt your wisdom. It is just that—well, we love you, Agar. Without you to lead us we would fight with sinking hearts."

"You would fight well enough," Monitor 236 heard himself replying. "You . . . you're just on the threshold of the warrior-king-priest stage. You think I possess magical powers. You haven't actually defied me yet, but when I'm dead you'll put me on so high a pedestal I won't be able to climb down and help you. You'll pick out someone to intercede for you—an unscrupulous old buzzard of a witch doctor who'll lead you deeper and deeper into the mire."

Babu pressed his lips together and looked away. "Sometimes your speech carries you away from us on wings of darkness," he said.

A look of bewilderment passed over Agar's face.

"What . . . what did I just say, Babu?"

"Don't make me repeat it," Babu replied.

"He has spoken strangely to me, too, Babu," the girl in the crook of Agar's arm said. "Sometimes it is better to wonder than to know why a great warrior must speak so. You must trust him as I do, Babu."

"I have not removed my trust from him," Babu growled. "But—"

The old warrior's eyes became a wet shine suddenly, and his hand darted to the hatchet at his waist.

"Here it comes," he grunted.

A sensation of fierce readiness stirred in Agar, tensing the muscles of his back. He saw Babu leap to rejoin his warriors, and felt the girl slipping from his clasp. There was a wetness on his chest over his heart, where she had pressed her cool lips as though to steel him for combat. A wetness on his chest, a feeling of fierce readiness and then he was leaping forward with his hatchet upraised.

The Prowlers were sweeping in on his people from every part of the square. With bloodcurdling screams they streamed over the converging motopavements, their shaven heads gleaming in the blueness and their lips snagged by their teeth.

There was no order or method in their attack and neither was there discipline in the ranks of Agar's warriors. From the first it was hand-to-hand and grip-to-grip, with hatchets rising and falling until the Central Square ran crimson.

Back and forth the battle surged, with barbarians pitted against savages now directly under the great, towering Half Body, and now beneath the long gray line of power conduits on the far side of the square and now in the middle of the square in a sickening crescendo of slaughter.

The Prowlers fought without giving or asking quarter. They seemed intent only on massacring Agar's people as fiendishly as possibly.

It was ghastly, and there was no stopping it. Wildly Agar found himself wrenching a hatchet from a hairy hand and chopping down on a nose that went shooting off in a gory sliver. With two hatchets he then assailed the yelling savage just beyond, only to have both hatchets torn from his clasp by a seven-foot giant with hairy shoulders.

Dodging a lunge that just missed his jugular, he dropped to one knee and butted upward with his skull. With a rattling cough the massive one went staggering backward, his skull split from behind by still another hatchet.

Old Babu had come panting up just in time. Babu had hurled the hatchet, but another Prowler wanted it. As Babu wrenched it from the big Prowler's splintered skull he had to kill again, with swift and gory precision.

Babu now had two hatchets and he handed one to Agar. Somewhere an unearthly scream rose and subsided. Something slithered along the pavement between Agar's spread legs until it came to rest against Babu's foot.

It had hair and eyes, but Babu kicked it. The next instant both men were vigorously separated, Babu by a press of savages that compelled him to give ground with fierce distortions of his countenance—Agar by an equally urgent necessity to cleave skulls in the opposite direction.

There seemed to be no end to the struggle. Agar could not even tell whether his people were losing or gaining ground. He only knew that all about him was the hue and cry of battle, and he seemed to be leading his people to victory in the midst of a rout.

Unbelievably to victory, though it was some time before he discovered the reason for the wild exaltation which shone in the eyes of his people as they surged about him. He was in the midst of his people now, and they were no longer fighting for their lives.

Only the Prowlers seemed to be fighting, for the yells which continued to arise from one side of the square, quite outside the ring of barbarian faces, were unmistakably savage in timbre.

It was a little absurd that he wasn't allowed to get a clear view of what was happening. But he knew the reason for it. It was the old "the head man is sacrosanct" taboo, closing in on him from all sides, and preventing him from knowing what was going on beyond the tight circle of fighting men determined to protect him from all danger, now that there was no longer any need for him to risk his life in battle.

It had almost all happened when his warriors fell back, affording him a clear view of the square.

It was a little sickening, and almost he regretted having yelled and waved his hatchet and insisting on his right to stare, when he might have been spared seeing the last of the Prowlers struggling in the clasp of the great, nonvolitional robots.

The Prowlers had tried to escape from the square by the only route open to them—a gleaming motoway that passed to the left of the Half Body, and spiraled upward about the Hall of Monitors. Seemingly they hadn't seen the robots descending the spiral toward them, clumping downward over the continuously ascending pavement and making continuous progress despite its upward sweep.

All but six of the robots were at the base of the spiral now and it was easy to see that they had the situation well in hand.

The robots were all whirring disks and agile digits. The robots were rectifying a kink in the vast, complex life of the city. Gouging, ripping, breaking up what remained of the kink.

Most of the kink lay now in huddled heaps at the base of the Half Body, the motoway beneath it glistening wet and slippery. The motoway was slowly carrying the kink out of sight and suddenly a score more limp and twisted Prowlers were hurled down, and the robots ceased to whir.

Grooves and hollow openings appeared in their gleaming body-cases, and retractile arms were whipped back out of sight. The buzz-saw wheels disappeared more slowly, seeming to glide from view and leaving crimson splotches in their wake.

Agar's harsh skin had whitened under the stunned brightness in his stare.

The robots had made no attempt to

attack his people, but suddenly he was aware that one of them had swung about, and was clumping toward him across the square. Nearer it came and nearer, as though the teleo-electronic impulses which were keeping it in motion had made it a little drunk.

It halted directly before him, settling down on its flat bottom, and transfixing him with the huge, dully gleaming eye in the middle of its hollow chest. Slowly, as though drawn by a magnet, Agar drew close to that great unwinking orb. He did not know why his heart was beating so furiously. He had looked into the eyes of robots often enough. He'd see one of the Public Safety men, of course, reflected in the depths of the eye, directing the robot from the Chamber of Public Safety.

There was a gruesome jest going the rounds that some day a Monitor would look into a robot's eye and see something utterly unexpected. A political satirist, a self-styled writer of horror tales, had originated that one. It had gone the rounds of filmstage and musicdrome and taken its toll of shivers. The Monitor would see something dry and huge and hideous instead of a Director of Public Safety, a fearful, whistling shape with a glistening stare, sitting in the Chamber of Public Safety and keeping the robots clumping to and fro on their appointed rounds.

Agar's face had a harsh, scoured look, as though it had been scraped dry by a bone. Slowly and with a chill prickling up his back, he stooped and stared into the robot's huge eye.

A startled cry came from his lips.

It was insane, unbelievable—it was against all reason! That Willie should have dared—

He was looking deep into the eye now, and he could see—*Willie!* The little robot was sitting in the Chamber of Public Safety with his metal fingers wrapped around the teleo-electronic impulse-sending apparatus. Gleaming wires descended from Willie's brain box to the apparatus, and behind him loomed the featureless gray walls of the chamber. But it seemed almost as though Monitor 236 could have stretched out his hand, and touched Willie.

"Willie!"

"Master!"

There was no mistaking the look in Willie's eyes. He was welcoming his maker home. He seemed now almost to be running toward his maker across the Central Square.

"Willie!"

"Master!"

"Willie!"

"Master!"

Suddenly the great, volitionless robot blinked, swung about on its ponderous heels, and went clumping across the Central Square to where the Half Body stood brooding in the blueness, with towered eyes that seemed to command the city's outermost domes and the everlasting cliff wall beyond.

Instinctively Monitor 236 knew that the robot was pointing at an inscription at the base of the statue. But he couldn't quite make out the inscription from where he was standing.

His temples were bursting and he had to move up very close to the pedestal, and even then he had to squint and strain. For an instant he seemed to be staring at the projecting metal letters through a shimmering veil behind which great pylons towered and as though his eyes had lost their focusing power and were burning holes through the back of his head. Then, quite suddenly, the shimmering subsided and the veil was gone.

The inscription read:

THE MAN WHO CONQUERED TIME

MONITOR 236
BORN 2857
DISAPPEARED IN TIME 2887

Willie, the thinking robot, sat in the Chamber of Public Safety, his metal legs dangling, and stared down through the eye of a volitionless robot at his maker's white face. Stared down into the great Central Square and heaved a sigh of relief.

He'd have a lot of explaining to do, but everything was going to be all right now.

The master was getting his memory back. He had recognized that bust of himself which had been erected in his honor down in the Central Square, and a glorious change had taken place in him.

The master's face had changed unmistakably. It was no longer the face of a barbarian but that of a Monitor. Gone was the tightness about the lips of his master, and the savage intensity which had smoldered in his stare.

He, Willie, hadn't known that traveling in time would warp his maker's mind. Amnesia—and the master had had it bad. Willie *did* know about amnesia, having had nearly a million years to mull over the metalfilm psychiatric data in the Chamber of Public Safety.

He hadn't known that the master would have it when he returned.

He had only known that the master *would* return, and that he, Willie, must remain a faithful keeper of the flame. There is no limit to a robot's patience.

Even when the time cylinder had reappeared, and the rude descendants of his maker's people had accepted him as one of themselves he, Willie, had kept the motoways moving, the great, volitionless robots clumping to and fro on their appointed tasks.

In his cold robot's mind's eye, Willie went back across wide wastes of years. He saw again his maker climbing into the time cylinder, brooking no opposition. He saw Monitors 235 and 237 clamping down the lid of the cylinder over the master's calm, determined face, skeptical to the last, exchanging glances which said as plain as words;

"Time travels involves too many imponderables. The odds against him are a million to one."

Well, the master had invented a thinking robot, so why not a cylinder that could travel far into the future? Monitors 235 and 237 had scoffed at Willie, too. But he, Willie, had survived for a million years—had outlasted all the Monitors and all the soft-spoken, civilized people.

He had survived and so had his memories. Time could not blur them, and now, in his cold mind's eye, he could see the cylinder revolving. Faster and faster, blurring and dimming until it seemed as though his grief must tear him asunder.

He could see it as clearly as though it had happened yesterday. Time could not blur a robot's memories, but time *had* blurred the cylinder. It had become a pale, opalescent cocoon, faintly luminous against a soft, pulsating blackness.

Then, quite suddenly, it had disappeared.

Willie's iridescent eyes paled, and his serrated metal jaw jigged downward.

In the great Central Square the master had turned and was embracing that *girl* again—a girl little better than a Prowler. Embracing her with shining eyes, as though he were a barbarian still and she were the only woman in the world for him.

For an instant Willie stared, his jaw sinking lower and lower. Then, with a click, he shut off the impulse-transmitting apparatus.

Love. Love was a disease, sort of, but the master had always had it. It was worse than amnesia, because there had never been a cure for it.

Still—he, Willie, wasn't sorry he had remained a faithful keeper of the flame. The master would rule again now, gently but firmly guiding his rude descendants back into paths of civilization.

The master would rule again.

THE END.

Symbiotica

by Eric Frank Russell

The exploring crew had run into some nasty jams with robots—but this machineless world seemed tame and safe enough for men armed as they were—till they learned about the possibilities of symbiosis!

Illustrated by Orban

I.

They'd commissioned the *Marathon* to look over one floating near Rigel, and what some of us would've liked to know was how the devil our Terrestrial astronomers could pick out likely specimens at such an arithmetical distance. Last trip they'd found us a juicy job when they sent us to that mechanical world and its watery neighbor near Bootes. The *Marathon,* a newly designed Flettner job, was something super. It hadn't a counterpart in our neck of the cosmos. So our solution of the mystery was that the astronomers had got hold of some instrument just as revolutionary.

Anyway, we'd covered the outward trip as per instructions and were near enough to see that once again the astronomers had lined them up for jackpot when they said that here was a planet likely to hold life. Rigel blazed like a distant furnace way over to starboard and about thirty degrees above the plane that was horizontal at that moment. What I mean is that the horizontal plane is always the ship's horizontal plane and the cosmos has to relate itself to it whether it likes it or not. But this plane's primary wasn't the far-off Rigel: it was a kid brother sun just a fraction smaller and paler than Old Sol. There were two more planets lying farther out, we'd seen yet another the other side of the sun. That made four in all, but three looked as sterile as a Venusian guppy's mind and only this one, the innermost one, seemed interesting.

We swooped on it bow first. The way that world swelled in the ports did things to my bowels. One trip on the casually meandering *Upsydaisy* had given me my space legs and got me used to living in suspense over umpteen million miles of nothing, but I reckoned it'd take me another century or two to get accustomed to the mad bull take-offs and landings of these Flettner craft. Young Wilson muttered in his harness and I knew that he was following his pious custom of praying for the safety of his precious photographic plates. From his look of spiritual agony you'd have thought he was married to the darned things. We landed, ***kerumph!*** The boat did a belly slide.

"I wouldn't grieve," I told Wilson. "Those things never fry you a chicken or shove a strawberry shortcake under your drooling mouth."

"No," he admitted, "they don't." Struggling out of his harness, he gave me the sour eye and growled. "How'd you like me to spit in the needlers?"

"I wouldn't," I snapped.

"See?" he said, and forthwith beat it to find out whether his stuff had survived.

Sticking my face to the nearest port, I stared through the immensely strong Permex disk, had a look at the new world. It was green. You'd've never believed any place could be so thoroughly and absolutely green. The sun, which had appeared a primrose color out in space, now looked an extremely pale green. It poured down a flood of yellowy-green light. The *Marathon* lay in a great glade that cut through a mighty forest, and the glade was full of green grasses, herbs, shrubs and bugs. The forest was one mass of tremendous growths that ranged in color from a very light silver-green up to a dark, glossy green that verged on black. Brennand came and stood beside me, his face promptly went a spotty and bilious green as the light hit it. He looked like one of the undead.

"Well, here we are again." He turned his attention from the port, grinned at me, abruptly wiped away the grin. "Hey, don't you be sick over me!"

"It's the light," I pointed out. "You look like something floating in the scuppers of a Moon-tripper."

"Thanks," he said.

"Don't mention it."

We stood there looking out and waiting for the general summons to the conference which usually preceded the first venture out of the ship. I was counting on maintaining my lucky streak by being picked out of the hat, and Brennand was itching to stamp his dogs outside, too. But the summons didn't come.

After a while, Brennand said, "The skipper's slow. What's holding him back?"

"No idea." I had another look at his leprous face. It was awful. Judging by his expression, he wasn't enamored of my features either. "You know what a cautious guy McNulty is. Guess that spree we had on Mechanistria persuaded him to count a hundred before giving an order."

"Yeah," agreed Brennand. "I'll go forward and see what's cooking."

He went along the passage. I couldn't go with him because I had to stand by the armory. You could never tell when they'd come for my stuff, and they had a habit of coming on the run. Brennand mooched disconsolately around the farther corner and had hardly gone when sure enough the exploring party barged in shouting for equipment. There were six of them: Molders, an engineer; Jepson, a navigating officer; Sam Hignett, our Negro surgeon, young Wilson and two Martians, Kli Dreen and Kli Morg.

"Huh, lucky again?" I growled at Sam, tossing him his needle ray and sundry oddments.

"Yes, sergeant." Sam's very white teeth glistened in his black face as he smiled with satisfaction. "The skipper says nobody's to go out afoot until we've first scouted around in No. 4 lifeboat."

Kli Morg got his needler in a long, snaky tentacle, waved the thing with bland disregard for everybody's personal safety, and chirruped, "Give Dreen and me our helmets."

"Helmets?" I looked from him to the Terrestrials. "You guys want spacesuits, too?"

"No," replied Jepson. "The stuff outside is up to fifteen pounds and so rich in oxygen you whizz while you think you're just ambling along."

"Mud," snapped Kli Morg. "Just like mud. Give us our helmets."

He got the helmets. These Martians were so accustomed to the three pounds atmospheric pressure of their native planet that anything heavier bothered them no end. That's why they had the use of the starboard air lock in which pressure was kept down to suit their taste. They could endure heavy pressure for a limited time, but sooner or later they'd wax unsociable and act like somebody had burdened them with all the world's woes.

We Terrestrials helped the pair of Martians to clamp down their goldfish bowls and exhaust the air to what they considered comfortable. If I'd lent a hand with this job once, I'd done it fifty times and it still seemed as wacky as ever. It isn't right that guys should be happy breathing in short whiffs.

Jay Score lumbered lithely into the armory just as I'd got all the clients decorated like Christmas trees. He leaned his three hundred pounds on the tubular barrier, which promptly groaned. He got off it quickly. His strong face was as impassive as ever, his eyes brilliant with their unearthly light.

Shaking the barrer to see it it was wrecked, I told him, "The trouble with you is that you don't know your own strength."

"No?" he inquired, with utter lack of tone. He turned his attention to the others. "The skipper wants you to be extra careful. We can't permit any copy of what happened to Haines and his crew. Don't fly below one thousand feet, keep the autocamera running, keep eyes skinned and beat it back here immediately you find anything worth reporting."

"Sure, Jay." Molders slung a couple of ammo belts over one arm. "We'll be careful."

They trailed out. Shortly, the lifeboat broke free with a squeaky parody of the *Marathon's* deep-throated, sonorous drumming. It curved sharply into the green light, soared over the huge trees and diminished to a dot. Brennand came back, stood by the port, watched the boat vanish.

"McNulty's as leery as an old maid with a penitentiary out back."

"He's got plenty of reason," I pointed out. "He's all the explaining to do when we return."

A smirk passed over his bilious complexion, and he went on, "I took a walk to the noisy end and found that a couple of those stern-gang punks have beaten us all to it. They're outside playing duck-on-the-rock."

"Playing what?" I yelped.

"Duck-on-the-rock," he repeated, enjoying himelf.

I beat it to stern, Brennand following with a wide grin. Sure enough, two of those dirty mechanics who polish the tail had pulled a fast one. They must have crawled out through a main driver not yet cool. Standing ankle-deep in the green growths, the pair of them were ribbing each other and shying pebbles at a small rock poised on top of a boulder. You'd have thought this was a Sunday-school picnic.

"Does the skipper know about this?"

"You bet he doesn't! Think he'd pick that pair of unshaven bums for first out?"

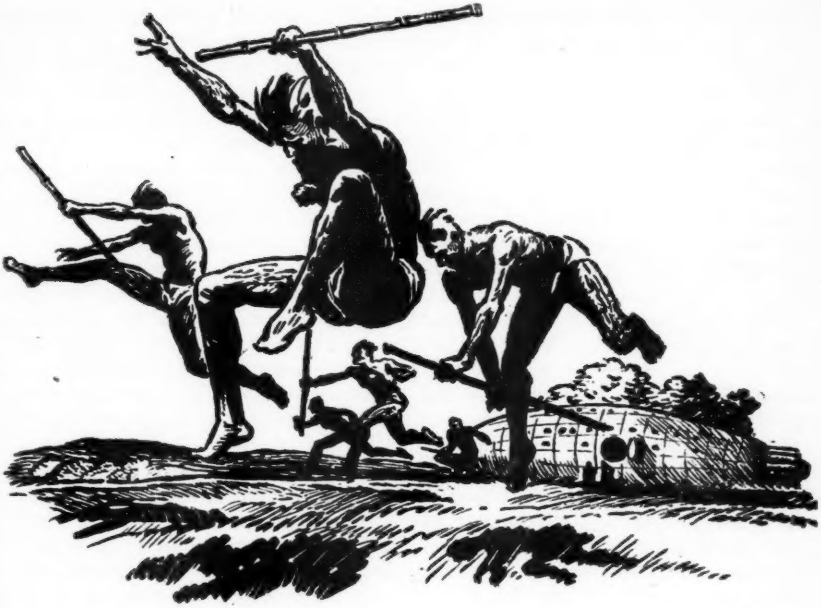
One of the couple turned, saw us staring at him through the port. He smiled toothily, shouted something we could not hear, jumped nine feet into the air, smacked his chest with a grimy hand. I gathered that the gravity was low, the oxygen high, and that he was feeling top notch. Brennand's face suggested that he was sorely tempted to crawl through a tube and join in the fun.

"McNulty'll skin those hoodlum," I said.

"Can't blame them. The artificial gravity's still on, the ship's full of fog and we've come a long, long way. It'll be great to get out. I could do some sand-castling myself."

"There isn't any sand."

The pair outside became tired of the rock, got themselves a supply of pebbles from somewhere down among the growths, advanced toward a big bush growing fifty yards from the *Marathon's* stern. The farther out they went, the more they were likely to be spotted from the skipper's lair, but they didn't care



a hoot. They knew McNulty couldn't do much more than lecture them.

This bush stood between ten and twelve feet high, had a very thick mass of bright green foliage at the top of a thin, willowy trunk. One of the approaching pair got a couple of yards ahead of the other, slung a pebble at the bush, struck it fair and square in the middle of the foliage. What happened then was so swift that we'd the utmost difficulty in following it.

The pebble crashed into the foliage, the entire bush whipped over as if its trunk was a steel spring. A trio of tiny creatures fell out of its leaves, dropped from sight in the herbage below. The bush stood as before, indisturbed except for a minute quivering in its topmost branches. But the guy who'd flung the missile lay flat on his face. His following companion had stopped and was gaping like one petrified by the unpected.

"Hey," squawked Brennand, "what happened there?"

Outside, the one who'd fallen flat stirred, rolled over, sat up and started picking at himself. The other one got to him, helped him pick. No sound came into the ship, so we couldn't hear what they might have been talking about or the oaths they were certainly using. The picking finished, the smitten one came unsteadily erect. His balance was lousy, and his companion supported him as they started back to the ship. Behind them, the bush stood as imperturbably as ever, even its vague quivers having died out.

Halfway to the *Marathon* the pebble-thrower teetered, went white. Then he licked his lips and keeled over. The other one looked anxiously back toward the bush as if he wouldn't have been surprised to find it charging them. Bending down, he got the body in a fireman's hitch, struggled with it toward the midway air lock. Jay Score met him before he'd heaved his load ten steps. Jay strode powerfully and confidently through the carpet of green, took the limp form from the other's arms, carried it like it was nothing. We raced toward bow to find out what had happened.

Jay brushed past us, carried his burden into our tiny surgery where Wally Simcox, Sam's side-kick, started working on the patient. The other guy hung around outside the door and looked sick. He looked even sicker when Captain McNulty came along and stabbed him with a stare before he went inside.

After half a minute, the skipper shoved out a red, irate face and bellowed, "Go tell Steve to order that boat back at once. He's to warn Sam he's urgently needed."

Pelting to the radio room, I passed the message on. Steve's eyebrows circumnavigated his face as he flicked a switch and cuddled the microphone to his chest. His rattled off the message, listened to the reply.

"They're returning at once."

Going back, I said to the uneasy duck-on-the-rock enthusiast, "What happened, Stupid?"

He flinched. "That bush made a target of him and filled his area with darts. Long, thin ones, like thorns. All over his face and neck and through his clothes. One of 'em made a pinhole in his ear, but they didn't get his eyes."

"Hell!" mouthed Brennand.

"A bunch of them whisked past me on my left, fell twenty feet behind. I heard 'em buzz like bees." He swallowed hard, shuffled his feet around. "It must have flung fifty or more. Guess I was lucky."

McNulty came out then. He looked pretty fierce, and the escapee promptly changed his mind about being lucky. The skipper said to him, very slowly and deliberately, "I'll deal with you later!" The look he passed across was enough to scorch the pants off a space cop. We watched his portly form parade down the passage.

The victim registered bitterness, scrammed to his post at stern. Next minute, the lifeboat made one complete circle overhead, descended with a thin zoom ending in a heavy *swish.* Its crew poured aboard the *Marathon* while the derricks clanked and rattled as they swung the lifeboat's twelve-ton bulk into the mother ship.

Sam was in the surgery an hour, came out shaking his head. "He's gone. We could do nothing for him."

"You mean he's—dead?"

"Yes. There's some sort of vegetable poison in those darts. It's virulent. We've no antidote for it. It seems to create blood clots, a condition of thrombosi." He rubbed a weary hand over his crisp, curly hair, added, "I hate having to report this to the skipper."

We followed him toward bow. I stuck my eye to the peephole in the starboard air lock as I passed and had a look at what the Martians were doing. Kli Dreen and Kli Morg were playing chess with three others watching them. As usual, Sug Farn was asleep in one corner. It takes a Martian to be bored by adventure and to sweat with excitement over a slow-motion game like chess. They alway did have an inverted sense of values.

Kli Dreen kept one saucerlike eye on the board while the other glanced idly at my face framed in the peephole. His two-way look gave me the meemies. I've heard that chameleons can swivel them independently, but no chameleon could do it so violently that the spectacle tied your own optic nerves in knots. I chased after Brennard and Sam. There was a strong smell of trouble up that end.

II.

The skipper fairly rocketed on getting Sam's report. His voice resounded loud and complainingly through the slightly open door.

"Hardly landed and already there's a casualty in the log . . . utter foolhardiness . . . more than a silly prank . . . disregard of standing orders . . .

sheer indiscipline." He paused while he took a breath. "The responsibility is mine. Jay, summon the ship's company."

The general call sounded throughout the ship as Jay Score pressed the stud. We barged in, the rest following close behind, the Martian arriving last. Eying us sourly, McNulty strutted up and down, lectured us at some length. We'd been picked as the crew of the *Marathon* because we were believed to be cool, calculating, well-disciplined individuals who'd come of age and had long outgrown such infantile attractions as duck-on-the-rock.

"Not to mention chess," he added, his manner decidedly jaundiced.

Kli Dreen started, looked around to see whether the others heard this piece of incredible blasphemy. Nobody spoke in denial.

"Mind you," continued the skipper, thinking again, "I'm no killjoy, but it is necessary to emphasize that there's a time and place for everything." The Martians rallied. "And so," McNulty went, "I want you always to—"

The ship's phone shrilled and cut him short. He had three phones on his desk, and he gaped at them as if his ears were telling him blatant lies. The ship's company looked each other over to see who was missing. They were all supposed to be there.

McNulty suddenly decided that to answer the phone would be a simple way to solve the mystery. Grabbing up an instrument, he shouted, "Yes?" One of the other phones whirred, proving him a bad picker. He slammed down the one he was holding, took up another, repeated, "Yes?"

The phone made squeaky noises against his ear while his florid features underwent the most peculiar contortions. "Who? What?" he said, incredulously. "What awoke you?" His eyes bugged out. "Somebody knocking at the door?" He planted the phone with the air of a sleepwalker, then spoke weakly to Jay Score. "That was Sug Farn. He complains that he's been disturbed from a siesta by somebody hammering on the turnscrew of the storrad lock." Finding a chair, he flopped into it, breathed asthmatically. His still popping eyes found Steve Gregory, and he snapped, "For Heaven's sake, man, control those eyebrows of yours!"

Steve pushed one up, pulled one down, opened his mouth and tried to look contrite. The result was imbecilic. Jay Score bent over the skipper, conversed with him in smooth undertones. McNulty nodded tiredly. Jay came erect, addressed us.

"All right, men, get back to your stations. The Martians had better don their helmets. We'll install a pom-pom in that lock and have the armed lifeboat crew standing ready. Then we'll open the lock."

That was sensible enough. You could see anyone approaching the ship in broad daylight, but you couldn't see them once they'd got close up. The side ports didn't allow a sharp enough angle, besides which anyone standing under the lock would be shielded by the vessel's bulge. Nobody mentioned it, but the skipper had made an error in holding a revival meeting without keeping watch. Unless the hammers chose to move farther out there was no way of getting a gander at them except by opening. And we weren't going to cook the dinner and make the beds before seeing what was outside, not after that nasty experience when intelligent machines had started to disassemble the ship around us.

Well, the dozy Sug Farn got pushed out of his corner and sent off for his goldfish bowl. We erected the pom-pom, its eighth barrel lined dead center on the closed door of the lock. Something made half a dozen loud clunks on the door as we finished. It sounded to me like a shower of flung stones.

Slowly the door spun along its worm and drew aside. A bright shaft of green light poured through, also a dollop of air that made me feel like a healthy hippopotamus. At the same time, Chief Engineer Douglas switched off the artificial gravity and we all dropped to two thirds normal weight.

We watched the green illuminated opening so intently and anxiously that it was easy to imagine an animated metal coffin suddenly clambering through, its front lenses staring glassily. But there came no whir of hidden machinery, no menacing clank of metal arms and legs, nothing except the sigh of invigorating wind in the distant trees, the rustle of blown grasses and a queer, faraway throbbing that I couldn't identify.

So silent was everyone that Jepson's regular breathing was loud over my shoulder. The pom-pom gunner squatted in his metal seat, his hard eyes focused along the sights, his finger ready on the trigger, his right and left hand feeders ready with reserve belts. All three were busy with wads of gum. Then I heard a soft pad-pad of feet moving in the grass below the lock.

We all knew that McNulty would throw a fit if anyone walked out to the rim. He still nursed memories of the last time somebody did just that and got snatched out. So we stayed put like a gang of dummies, waiting, waiting. Presently, there sounded a querulous gabble beneath the opening. A smooth rock the size of a mellon flew through the gap, missed Jepson by a few inches, shattered against the back wall.

Skipper or no skipper, I got fed up, hefted my needler in my right hand, prowled half-bent along the footwalk cut through the threads of the air-lock opening. I reached the rim which was about nine feet above ground level, shoved out my inquiring face. Molders pressed close behind me. The muffled throbbing was clearer than ever, but just as elusive.

Beneath me stood a band of six beings who were startlingly human in general appearance. Same bodily contours, same limbs and digits, same features. They differed from us mostly in that their skins were coarse and crinkly, a dull, dead green in color, and that they had a peculiar organ like the head of a green and fleshy chrysanthemum growing out of their chests. Their eyes were sharp and jet-black, they jerked them about with monkeylike alertness.

For all these differences our similarity was so surprising that I stood staring at them while they stood staring back at me. Then one of them shrilled something in the singsong tones of an agitated Chinese, swung his right arm, did his best to bash out what I use for brains. I ducked, heard the missile swish over my hair. Molders also ducked it, involuntarily pushed against me. The thing crashed somewhere inside the lock, I heard someone spit a lurid oath just as I overbalanced and fell out.

Clinging grimly to the needle ray, I flopped into soft greenery, rolled like mad and bounced to my feet. At any instant, I expected to see a shower of meteors as I got slugged. But the six weren't there. They were fifty yards away and moving fast, making for the forest in long, agile leaps that would have shamed a hungry kangaroo. It would have been easy to have brought two or three of them down, but McNulty would have crucified me for that. Earth laws were strict about treatment of extramundane aborigines.

Molders dropped down beside me, followed by Jepson, Wilson and Kli Yang. Wilson had his owl-eye camera with a color filter over the lens. He was wild with excitement.

"I got them from the fourth port. I made two shots as they scrammed."

"Humph!" Molders stared around. He was a big, burly, phlegmatic man who looked more like a Scandinavian brewer than a space bug. "Let's follow them to the edge of the forest."

"Yeah," agreed Jepson, heartily. He wouldn't have been so hearty if he'd known what was coming to him. Stamping his feet in the springy turf, he took a lungful of the oxygen-rich air. "This is our chance for a legitimate walk."

We started off without delay, knowing it wouldn't be long before the skipper began baying for us to come back. There was no man so hard to convince that risks have to be taken and that casualties are the price of knowledge, nor was there any man who went so far determined to do so little.

Reaching the verge of the forest, the six green ones stopped and watched our approach. If they were quick to beat it when caught out in the open, they weren't so quick when in the shadow of the trees which, for some unknown reason, inspired them with confidence. Turning his back to us, one of them doubled himself, peered at us from between his knees. It seemed senseless.

"What's that for?" growled Jepson.

Wilson sniggered dirtily, and said, "The Arab's farewell to his steed. It must be of cosmic significance."

"I could have scalded his seat if I'd been quick," remarked Jepson, aggrievedly. Then he put his foot in a hole and fell on his face.

The green ones set up a howl of glee, flung a volley of stones which all fell far short. We began to run, going along in great bounds. The low gravity wasn't spoiled by the thick blanket of air which, of course, pressed equally in all directions. Our weight was down so that we went along several laps ahead of Olympic champions. Five of the green ones promptly faded into the forest; the sixth shot like a squirrel up the trunk of the nearest tree. Their behavior told that they'd reason for regarding the trees as safe refuge against all assault.

We stopped about eighty yards from that tree which, for all we knew, might have been ready for us with a monster load of darts. Our minds recalled what one bush had done. Scattering in a thin line, each ready to flop at the first untoward motion, we edged cautiously toward it. Nothing happened. We went nearer. Still nothing happened. In this manner we got well beneath its branches and close to its trunk. There was a strange fragrance like that of a mixture of pineapple and cinnamon. The elusive throbbing was stronger than ever.

It was a big, imposing tree. Its dark green, fibrous trunk, seven feet in diameter, soared up to twenty-five feet before it split into strong, lengthy branches each of which terminated in one huge, spatulate leaf. Looking at that trunk, it was difficult to tell how our quarry had fled up it, but he'd performed the feat like an adept.

All the same, we couldn't see him. Carefully, we went around the tree, gazing up into its great branches through which the green light filtered in large mosaic patterns. There was not a sign of him. No doubt about it, he was somewhere up there, but he simply couldn't be spotted by us. There wasn't any way in which he could have passed from this tree to its nearest neighbor, neither could he have come down. Our view up this lump of alien timber was fairly good considering the peculiar light, but the more we stared the more invisible he remained.

"That's a puzzler!" Jepson stepped well away from the trunk, seeking a better angle of view.

With a mighty *swoosh* a branch above his head drove down. Its spatulate leaf smacked him squarely in the back and a waft of pineapple and cinnamon went all over the place. Just as swiftly, the branch went up, carrying Jepson high into the air. Swearing like a tail mechanic, he struggled furiously while we gathered below him. He was stuck to the underside of that great leaf, gradually became covered in thick, yellowy-green goo as he writhed. The stuff must have been fifty times stickier than birdlime.

Together we roared at him to keep still before he got the deadly junk spread all over his face. Already his clothes were covered with it, his left arm tied up in it. He looked a mess. It was obvious that once he smeared it over his mouth and nostrils he'd stick up there and quietly suffocate.

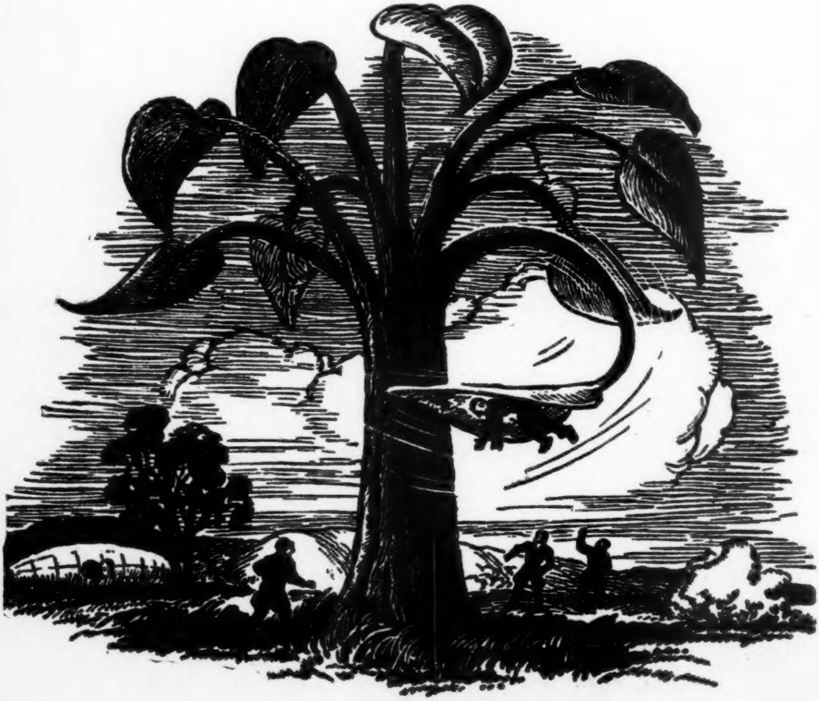
Molders had a try at getting up the trunk, found it impossible. He edged out to have a look upward, came in when he noticed another leaf in a strategic position. The safest place was beneath the unfortunate Jepson. A little over twenty feet up, the goo was slowly spreading over its victim and I reckoned that in half an hour he'd be completely covered—in much less if he wriggled around. All this time the dull pulsations continued as if ticking off the last moments of the doomed. They made me think of jungle drums heard through thick walls.

Gesturing to the golden cylinder which was the *Marathon* lying five hundred yards away in the glade, Wilson said, "Let's beat it back and get ropes and steel dogs. We'll soon bring him down."

"No," I answered. "We'll get him down a darned sight faster than that." Whereupon I aimed my needle ray at the point where Jepson's leaf joined the branch. The beam lanced forth at full strength.

The leaf dropped off and the tree went mad. Jepson fell into soft, springy undergrowth, the leaf still firmly fastened to his back. He landed with a wild yelp and a flood of curses. While we all lay flat, frantically trying to bury ourselves deeper, the tree thrashed around, its gum-laded spatulates hungry for vengeance.

One persistent branch kept beating within a yard of my head as I tried to shove said toppiece below ground. I hated the stink of pineapple and cinnamon that permeated the air. And



it made me sweat to think how my lungs would strain, my eyes pop and my heart burst if I got a dollop of that junk slap in the face. I'd sooner've been neatly needled.

The tree ended its wild larruping, stood like a dreaming giant liable to wake into frenzy at any moment. Crawling to Jepson, we dragged him out of reach. He couldn't walk, his jackboots and the legs of his pants being firmly stuck together. His left arm was just as securely gummed to his side. He was in an awful pickle, cursed steadily and without pause for breath or thought. We'd never suspected him of such fluency. But we got him into the safety of the glade, and it was there I thought up a few words he'd overlooked.

III.

Molders stolidly said nothing, contenting himself with listening to Jepson and me. Molders had helped me to the dragging and now neither of us could let go. We were fixed to the original victim, bonded like brothers but not talking like brothers. There was nothing to do but carry Jepson bodily with our hands remaining on the most inconvenient parts of his anatomy. He had to go horizontally and face downward, as if he was a drunk getting frogmarched to barracks. He was still adorned with the leaf. He was still reciting.

The task wasn't lightened by that young fool Wilson who thought there was something funny in other people's misforunes. He followed us, snapping his accursed camera which I could have stuffed down his gullet with the greatest of pleasure. He was too happy about the fact that there wasn't any goo on him.

Jay Score, Brennand, Armstrong, Petersen and Drake met us as we lumbered awkwardly, across the sward. They looked curiously at Jepson, listened to him with much respect. We warned them not to touch. The pair of us weren't feeling too sprightly by the time we reached the *Marathon*. Jepson's weight was only two thirds normal, but after five hundred yards he seemed like the last remains of a glutinous mammoth.

We dumped him on the grass below the open lock, perforce sitting with him. The faint booming sound was still coming out of the forest. Jay went inside the ship, brought out Sam and Wally to see what they could do about the super-adhesive. The stuff was stiffening, growing gradually harder. My hands and fingers felt as if they'd been set into glassite gloves.

Sam and Wally tried cold water, lukewarm water and hot water, but none of it did any good. Chief Engineer Douglas obliged them with a bottle of rocket fuel. That didn't work either. They had a go with some special gasoline which Steve Gregory kept for the crew's cigarette lighters. They wasted their time. That gasoline could play hell with rubber, but it couldn't dissolve this stuff.

"Stick it, fellers!" advised Wilson, cackling loudly. Jepson made sulphuric mention of this idiot's parents. I enlarged upon his grandparents. Jepson turned to the subject of his nonexistent progeny. Molders looked stolid, said nothing. "You sure are in a fix," went on Wilson. "By gum!"

Then Sam came out with some iodine. It didn't work, but it did make a terrible stink. Molders permitted his face to look slightly pained. Some nitric acid caused bubbles on the surface of the semihard goo, but did no more than that. It was risky stuff to use, anyway. Frowning, Sam went back to look for something else, passed Jay Score coming out to see how we were doing. Jay stumbled as he got near, a strange thing for him to do considering his superhuman sense of balance. His solid three hundred pounds nudged young Wilson between the shoulder blades and that grinning ape promptly flopped against Jepson's legs. Wilson struggled and changed his tune, but stayed stuck. Jepson gave him the sardonic ha-ha, and the other didn't enjoy it a bit.

Picking up the dropped camera, Jay dangled it in one powerful hand, said contritely, "I never missed a step before. It is most unfortunate."

"Unfortunate, hell!" yelled Wilson.

Sam came out out with a big glass jar, dribbled its contents over my gooey hands. The ghastly green covering at once thinned into a weak slime and my hands came free.

"Ammonia," remarked Sam. He needn't have mentioned it—I could smell the pungent stuff. It was a good solvent, and he soon had us cleaned up.

Then I chased Wilson three times around the ship. He was too fast for me. We were just about to go aboard to tell our tale to the skipper when that tree started threshing again. You could see its deadly branches beating the air and hear the violent *swoosh* of them even at that distance. Pausing beneath the lock, we watched the spectable wonderingly. Suddenly, Jay Score spoke, his voice metallic, harsh.

"Where's Kli Yang?"

None of us knew. Now I came to think about it, I couldn't recall him being with us while we dragged Jepson home. The last I remembered of him was when he stood beside me under that tree and his saucer eyes gave me the creeps by carefully scanning two opposite branches at once. Armstrong shot into the ship, came out with the report that Kli Yang definitely wasn't there. His own eyes as saucerlike as the missing Martian's, Wilson said that he didn't remember Kli Yang coming out of the forest. Upon which we snatched up our needlers and made for that tree at the run. All the while, the tree continued to larrup around like a crazy thing tied down by its own roots.

Reaching the monstrous growth, we made a circle just beyond the sweep of its treacherous leaves, had a look to see where the Martian was wrapped in glue. He wasn't wrapped in glue. We found him forty feet up the trunk, five of his powerful tentacles clamped around its girth, the other five embracing the green native we'd pursued. His captive was struggling wildly and futilely, all the time yelling a high-pitched stream of gibberish.

Carefully, Kli Yang edged down the trunk. The way he looked and moved made him resemble an impossible cross between a college professor and an educated octopus. His eyes rolling with terror, the native battered at Kli's glassite helmet. Kli blandly ignored the hostility, reached the branch that had caught Jepson, didn't descend any farther. Still grasping the furiously objecting green one, he crept along the whipping limb until he reached its leafless end. At that point, he and the native were being waved up and down in twenty-five feet sweeps.

Timing himself, he cast off at the lowermost point of one beat, scuttled from reach before another eager branch could swat him. There was a singing howl from the nearer parts of the forest and something that looked like a blue-green coconut shot out of the shadows and broke at Drake's feet. The thing was as thin and brittle as an empty eggshell, had a white inner surface, and contained nothing. Kli Yang took no notice of the howls or the missile, bore his still struggling captive toward the *Marathon*.

Hanging back, Drake peered curiously at the coconut or whatever it was, struck the fragments of shell with his boot. He caught the full benefit of something invisible that was floating up from it, sucked in his cheeks, screwed up his eyes and backed away. Then he retched. He did it so violently that he fell over as he ran. We'd the sense to pick him up and rush him after Kli without getting too nosy about what had bitten him. He continued to regurgitate all the way across the grass, recovered just as we came under the ship's bulging side.

"Holy smoke!" he wheezed, "what a stench! It'd make a skunk smell like the rose of the animal world." He wiped his lips. "My stomach turned right over."

Looking up Kli, we found that his captive had been conducted to the galley for a peace-making feed. Kli dragged off his helmet, said, "That tree wasn't so difficult for me to mount. It walloped around as I went up, but it couldn't get at anything on its own trunk." He sniffed, rubbed his flat, Red Planet face with the flexible tip of a great tentacle. "Don't know how you bipeds can swallow this soup which you're pleased to regard as air."

"Where'd you find the greenie, Kli?" asked Brennand.

"He was stuck to the trunk more than forty feet up. His whole front fitted neatly into an indentation shaped like himself, and his back matched the trunk so perectly that I couldn't see him until he moved uneasily as I got near him." He picked up the helmet. "I was a most wonderful sample of camouflage." He looked at the helmet with one eye, kept the other on the interested Brennand, made a gesture of disgust. "How about pulling down the pressure some place where higher forms of life can live in peace?"

"We'll pump out the port lock," Brennand promised. "And don't be so all-fired snooty, you caricature of a rubber spider."

"Bah!" said Kli, with great dignity. "Who invented chess? And who can't even play duck-on-the-rock without grabbing the grief?" With that insulting reference to Terrestrial inexpertness at chess, he slapped on his glassite dome. I pumped it down for him. "Thanks!" he said, through the diaphragm.

Now to get the low-down on the greenie.

Captain McNulty himself interviewed the native. The skipper sat grandly behind his metal desk, eyed the jittery captive with a mixture of pomposity and kindliness. The native stood before him, his black optics jerking around fearfully. At that close range you could see he was wearing a loincloth that matched his own skin. His back was several shades darker than his front, coarser, more fibrous, with little nodules here and there—perfect simulation of the surface of the trunk of the tree in which he'd sought refuge. Even his loincloth was darker at the back than at the front. His feet were broad and bare; the toes double-jointed and as long as the fingers of his hands. Except for the loincloth, he was completely naked and had no weapons. The queer chrysanthemum growing out of his chest attracted all eyes.

"Has he been given a meal?" asked the skipper, full of solicitude.

"He was offered one," Jay told him. "He refused it. As far as I can make out, he wants to go back to his tree."

"Hm-m-m," grunted McNulty. "In due time, in due time." He assumed the expression of a benevolent uncle, said to the native, "What's your name?"

The green one grasped the note of interrogation, waved his arms, broke into an untranslatable tirade. On and on he went, helping his gabble with many emphatic but incomprehensible gestures. His language was very liquid, his voice singsong.

"I see," murmured McNulty as the flood of talk petered out. He blinked at Jay Score. "Think this fellow is telepathic, like those lobster things were?"

"It is much to be doubted. I'd put him at the level of a Congo pygmy—maybe lower. He doesn't even possess a simple spear, let alone bow and arrow or a blowpipe."

"Yes, that's how he looks to me." Still maintaining his soothingly paternal air, McNulty went on, "All right, Jay. There's no common basis on which we can gain his understanding at the start, so I guess we'll have to create one. We'll dig up a natural linguist, set him to learning the rudiments of this fellow's language and teaching him some of ours."

"I've got the advantage of a mechanical memory—let me have a try," suggested Jay. He approached the green native, his huge, well-proportioned body moving quietly on the sponge rubber cushions of his dogs. The native didn't like his size or his bearing, neither did he approve of those brightly lit eyes. He backed away from Jay, backed right to the wall, his optics darting hither and thither.

Jay stopped as he saw the other's fear, slapped his own toppiece with a hand that could have knocked mine clean off my neck. He said, "Head." He did it half a dozen times, repeating, "Head, head."

The green one wasn't so stupid; he caught on, faltered, *"Mah."*

Touching his own head again, Jay said, inquiringly, *"Mah?"*

"Bya!" lilted the other, starting to recover his composure.

"See, it's dead easy," approved McNulty. *"Mah*—head; *bya*—yes."

"Not necessarily," Jay contradicted. "It all depends upon how his mind translated my action. *Mah* might mean head, face, man, hair, god, mind, thought, or alien, or even the color black. If he's thinking of my hair and his own, then *mah* probably does mean black, while *bya* may mean not yes, but green."

"Oh, I hadn't thought of that." The skipper looked crushed.

"We'll have to carry on with this performance until we've picked up enough words to form lame sentences. Then we can deduce further meanings from the context. Give me a few days."

"Go ahead. Do your best, Jay. We can't expect to be able to talk turkey in the first five minutes. It isn't reasonable."

Taking our prisoner to the rest room, Jay summoned Minshull and Petersen. He thought three might just as well learn something as one. Minshull and Petersen were both hot on languages, speaking Esperanto, Ido, Venusian, low Martian and high Martian. They were the only ones aboard the ship who could give our chess maniacs a boiling in their own lingo.

I found Sam in the armory, waiting to hand in the stuff he'd taken out, and I said to him, "What did you see from the lifeboat, Sam?"

"Not so much. We weren't out long enough. Didn't get more than a hundred and twenty miles away. There was forest, nothing but forest with glades here and there. A couple of glades were the size of counties. The biggest of them lay at the end of a long lake. There were several rivers and streams."

"Any signs of life?"

"None." He gestured down the passage toward the rest room where Jay and the others were cross-examining the native. "It seems there's superior life in the forest, but you can detect no signs of it from above. Wilson's processing his reel—I doubt whether his camera caught anything that we missed."

"Ah, well," I said, "one twenty miles in one direction is nothing from which to estimate a world. I don't let myself be deluded, not since that drummer sold me a can of striped paint."

He chuckled. "Didn't it come out?"

"I laid it wrong side up," I told him.

It was right in the middle of that bantering that a powerful idea smote me. I followed him out of the armory, made a rush to the radio room. Steve Gregory was sitting by his instruments trying to look busy doing nothing. I was all set to wake him with my brain wave.

IV.

As Steve looked up inquiringly, I said to him, "Hey, how about combing the bands?"

"Uh?"

"Remember those weird whistles and waterfalls you picked up on Mechanistria? Well, if anyone's radiating here, couldn't you detect 'em?"

"Sure." He kept his bushy eyebrows still for once, but spoiled it by waggling his ears. "If anyone was radiating."

"Go ahead and find out. It'll tell us something. What're you waiting for?"

"Have you kept those needlers cleaned and charged?" he asked.

I stared at him. "You bet I have! They're always ready for action. That's my job."

"And this one's mine," he said, dryly. He waved the ears again. "You're hours behind the times. I searched the ether immediately we landed, got nothing but a faint hiss on twelve point three meters. It was Rigel's characteristic discharge and came from that way. D'you think I'm that snake-armed snorer Sug Farn?"

"No, I don't. Sorry, Steve—it just struck me as a bright idea."

"Oh, it's O. K., sergeant," he said, amiably. "Every man to his job and every tail mechanic to his dirt." Idly he twiddled the shining dials of his slow-motion selectors.

The loud-speaker coughed as if it was clearing its throat, then announced in sharp tones, *"Pip-pip-whop! Pip-pip-whop!"*

Nothing could have been better calculated to upset the determined serenity of his brows. I'll swear that after they'd entered his hair they continued over the top, down the back and lodged under his collar.

"Morse," he said, in the complaining tone of a hurt child.

"I always thought Morse was a code, not a mode," I remarked. "Anyway, if it is Morse, you'll be able to translate it." I paused as the loud-speaker shouted me down with, *"Pip-pipper-pee-eep-whop!"* then I concluded, "Every cat to his ash can."

"'Tain't Morse," he contradicted himself. "But it's spark signals." He might have frowned if it hadn't taken too long to drag the brows back. Giving me one of those tragic looks you get sometimes, he snatched a pad, started recording the impulses.

The spacesuits, pom-pom chargers and other things had to be done, so I left him, returned to the armory, got on with my work. He was still fiddling around when darkness fell. So were Jay and his gang, but not for long.

The sun sunk, its long, greenish streamers faded from the sky and a velvet pall covered the forest and the glade. I ambled along the passage toward the gallery and was passing the rest room when its door jerked open and the green native burst out. His face was desperate, his legs going as if there was a thousand international smackers tied to the tape. Minshull yelped somewhere back of him as he jumped full tilt into my ready arms. The greenie squirmed like an eel, beat at my face, tried to kick my legs off my torso with his bare feet. His rough, harsh body exuded a weak odor of pineapple and cinnamon.

The others pounced out, got him tight, talked to him in halting words until he relaxed. His eyes shifty, anxious, he jabbered excitedly to Jay Score, making urgent gestures and waving his woody arms around in a way that reminded me of branches beating the air. Jay soothed him with fair if faltering speech. It looked like they'd picked up enough words to get along, though not enough to understand each other perfectly. Still, they were managing.

Eventually, Jay said to Petersen, "Tell the skipper I want to let Kala go."

Petersen cleared off, came back in a minute. "He says do whatever you think is best."

"Good." Conducting the native to the opening of the starboard lock, Jay yapped to him briefly, let him go. The greenie dived off the rim. Someone in the forest must have owed him for a loincloth because his feet made rapid brushing sounds as he fled across the turf. Jay stood on the rim, his flaming orbs staring into outer gloom.

"Why let him go, Jay?"

Turning, he said to me, "I've tried to persuade him to come back at sunup. He may, or he may not—it remains to be seen. We didn't have time to get much out of him, but his language is exceedingly simple and we picked up enough of it to learn that he calls himself Kala of the tribe of Ka. All members of his tribe are named Ka-something, such as Kalee, Ka'noo, or Kaheer."

"Something like the Martians with their Klis and Leids and Sugs," I remarked.

"Something," he agreed, not caring what the Martians might think of being compared with the green aborigines. "He also told us that every man has his tree, every gnat its lichen. I can't understand what he means by that, but he satisfied me that his life depended upon him being with his tree during darkness. It was imperative. I tried to delay him, but his need was almost pitiful. He was willing to die rather than be away from his tree."

"Sounds silly to me." I blew my nose, grinned widely. "It's sounds even sillier to Jepson."

Jay stared again into the deep murkiness from which came strange, nocturnal scents and those everlasting pulsations. Quietly, he said, "I also learned that there are others in the dark, others mightier than the Ka. They have much *gamish.*"

"They have what?"

"Much *gamish,*" he repeated. "That word defeated me. He used it again and again. He said that the *Marathon* had much *gamish,* I had much *gamish* and that Kli Yang had very much *gamish.* Captain McNulty, it appeared, had only a little. The Ka have none at all."

"Was it something of which he was afraid?"

"Not exactly. As far as I could make out, anything unusual or surprising or unique is chock-full of *gamish.* Anything just abnormal has a lesser amount of *gamish.* Anything ordinary has none at all."

"This," I said, "goes to show the difficulties of communication. It isn't as easy as the people back home think it ought to be."

"No, it isn't." His gleaming optics shifted toward Armstrong leaning against the pom-pom. "You doing this guard?"

"Until twelve. Kelly follows me."

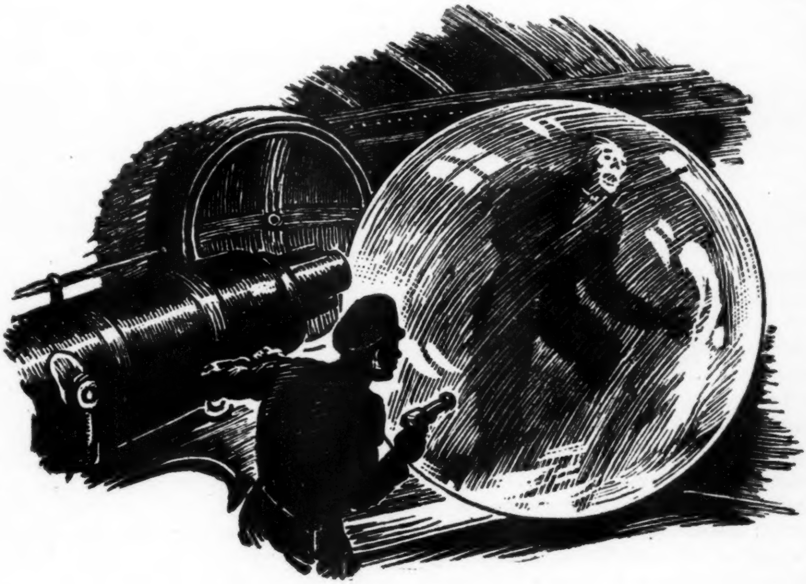
Picking Kelly for guard was poor psychology. That tattooed specimen was welded to a three-foot spanner and in any hot moment was liable to wield said instrument in preference to such new-fangled articles as pom-poms and needlers. Rumor had it that he'd held the lump of iron at his wedding and that his wife had gained a divorce on account of the thing's effect on her morale. My private opinion was that Kelly had a Neanderthal mind.

"We'll shut the lock," decided Jay, "fresh air or no fresh air." That was characteristic of him, and what made him seem so human—he could mention fresh air as if he used it himself. The casual way he did it made you forget that he'd never taken a breath since the day old Knud Johanssen stood him on his dogs. "Let's plug in the turnscrew." Turning his back upon the throbbing gloom, he started to walk into the lighted lock, treading carefully in the cutout of the threads.

A piping voice sprang from the darkness; it ejaculated, *"Nou baiders!"*

Jay stopped dead. His eyes were glowing. Feet padded outside just underneath the lock. Something spherical and glassy soared through the worm, went over Jay's left shoulder, broke to shards on the top recoil chamber of the pom-pom. A thin, golden liquid splashed around, vaporized instantly.

Reversing, Jay faced the black opening. Armstrong got to the wall, put out a thumb to jab the general alarm stud. Without touching the stud, Armstrong went down as if batted by an invisible club. My needler out, its muzzle extended, I began to move cautiously forward, saw the glittering thread of the worm framing a picture of Jay standing against the ebony background. It was a hell of a mistake—I should have gone for that stud. Three steps, and the whole picture swelled like a blown bubble, the circle widened, the threads of the worm became broad and deep with Jay as a gigantic shape in the middle. The bubble burst and I went down as soggily as Armstrong had done.



Don't know how long I stayed that way, for when I opened my eyes it was with the faint memory of hearing much shouting and stamping of feet around my prostrate form. Things must have happened over and all around me while I lay like a corpse. Now I was still flat. I reposed full length on deep, dew-soaked turf with the throbbing forest close on my left, the indifferent stars peering at me from the vault of night. It was bound up like an Egyptian mummy. Jepson was another mummy at one side of me; Armstrong and several more at the other.

Several hundreds of yards away, noises were still spoiling the silence of the night, a mixture of occasional Terrestrial oaths and many queer, alien pipings. The *Marathon* lay over there; all that could be seen of her in the general blackness was the funnel of light pouring from her open lock. The light flickered, waxed and waned, once or twice was momentarily obliterated. There was a struggle on that shaft of light which became blocked as the fight swayed to and fro.

Jepson was snoring as if it was Saturday night in the old home town, but Armstrong was in full possession of his wits and tongue. He cursed luridly. Rolling over, he started to chew at the knots of Blaine's bindings. Something vaguely human emerged silently from the darkness, smote downward. Armstrong went quiet.

Blinking my eyes, I adapted them enough to make out many more noiseless shapes standing around us. Keeping still and behaving myself, I thought noncomplimentary thoughts about McNulty, the *Marathon,* old Flettner who'd invented the ship and all the public-spirited guys who'd backed him morally and financially. I'd always had the feeling that sooner or later they would be the death of me.

Deep down inside me, a tiny voice said, "Sergeant, d'you remember that promise you made your mother about obscene language? D'you remember when you gave that guppy a can of condensed milk for a pinfire opal not as big as the city clock? Repent, sergeant, while there yet is time!"

The distant pipings arose crescendo, the few earthly voices died out. There sounded occasional smashings of light, brittle things. More shapes brought more bodies, dumped them beside us, melted back into the gloom. I wish I could have counted the catch, but darkness didn't permit it. All the newcomers were unconscious. They revived rapidly. I could recognize Brennand's angry voice and the skipper's asthmatic breathing.

A blue star shone through the thin fringe of a drifting clouds as the fight ended. The succeeding pause was ghastly; a solemn, brooding silence broken only by the scuffle of many feet through the grass and the steady pumping in the forest.

Forms gathered around us in large number. The glade was full of them. Hands lifted me, felt my bonds, tossed me into a wicker hammock. I went up shoulder-high, was borne along. You'd have thought I was a defunct wart hog being toted in some sportsman's line of native porters. Just meat—that was me. Just a trophy of the chase. I wondered whether God would confront me with that guppy.

The caravan filed into the forest, my direction of progress being head first. Another hammock followed my feet and I could sense rather than see a string of them farther behind. Jepson was the sardine following me; he went along making a loud recitation about how he'd got tied up ever since he landed in this unprintable world. Curving warily around one dim tree, our line marched boldly under the next, dodged the third. How the deuce our bearers could tell one growth from another in this lousy light was beyond my comprehension.

We'd just got deep into the deeper darkness when a tremendous explosion sounded way back in the glade and a column of fire lit up the whole sky. Even the fire looked faintly green. Our line stopped. Two or three hundred voices cheeped querulously, running from the front past me to a hundred yards farther back. "They'd blown up the good old *Marathon,*" thought I. "Ah, well, all things come to an end, including the flimsiest hope of returning home."

The squeakers were drowned out as the noisy pillar of flame built itself up to a roar. My hammock started to jump as its bearers reacted. The way they put on the pace had to be experienced to be believed; I almost flew along, dodging this tree, but not that, sometimes avoiding half-seen growths that weren't trees at all. My heart was in my boots.

The bellowing back in the glade suddenly ended in a mighty thump, and a crimson spear flung itself into the sky and stabbed the clouds. It was a spectacle I'd seen before: it was a spaceship going up. It was the *Marathon!*

Were these creatures so talented that they could pick up a thoroughly strange vessel and take it wherever they wanted it? Were these the beings described as superior to the Ka? The whole thing was incongruous—expert astronauts carrying their prisoners in wicker hammocks. Besides, the way they'd jabbered and put on the pace suggested that the *Marathon's* spurt of life had taken them by surprise. The mystery was one I couldn't solve.

While the fiery trail of the spaceship arced northward, our party pressed hurriedly on. There was one stop during which our captors congregated together, but their continual piping suggested that they hadn't stopped for a meal. Twenty minutes afterward there was another halt and a hell of a row in front. Guards kept close to us while a short distance ahead sounded a vocal uproar in which many voices vied with a loud mewing and much beating of great branches. I tried to imagine a bright green tiger.

Things went *phut-phut* and the mewing ended in a choking cough. The sound of whipping branches died away. We moved on, making a wide curve around a monstrous growth that I strained in vain to see. If only this world had possessed a moon. But there was no moon. There were only the stars and the clouds and the forest from which came that all-pervading beat.

Dawn broke as the line warily bent away from a small clump of apparently innocent briers. We came to the bank of a wide river. Here, we could give our guards the once-over as they shepherded bearers and burdens down the bank. They were creatures very much like the Ka, only taller, more slender, with big, intelligent eyes. They had the same fibrous skins, grayer, not so green, and the same chrysanthemums on their chests. Unlike the Ka, their middles were clothed in pleated garments, they had harness of woven fiber, and wooden accouterments which included things like complicated blowguns and bowl-shaped vessels having a bulbous container in the base. A few also bore panniers holding small spheres like the one that had laid me flat in the air lock.

Craning my head, I tried to see more, but could only discern Jepson in the next hammock and Brennand in the one behind that. The next instant, my hammock was unceremoniously dumped by the water's brink, Jepson's beside mine, the rest in a level row.

Jepson screwed round his head, looked at me, and said, "The punks!"

"Take it easy," I suggested. "If we play with them, they may give us more rope."

"And," he said, viciously, "I don't like guys who try to be funny at the wrong time."

"I wasn't trying to be funny," I snapped. "We're all bound to hold our own opinions, aren't we?"

"There you go again!" He writhed around on his hammock, tried to stretch his fastenings. "Some day I'll bind you!"

It's no use talking with a guy like that, so I didn't answer. The light waxed stronger, shone greenly through the thin, green mist hanging over the green river. I could now see Blaine and Minshull tied up beyond Armstrong, and the portly form of McNulty beyond them. We'd traveled about two hours.

Ten of our captors went along the line opening jackets and shirts, baring our chests. They had with them a supply of the bowls with bulbous containers. Two of them pawed my uniform apart, got my chest exposed, stared at it like Anthony stared at Cleopatra. Something about it struck them as wonderful, and it wasn't my reserve beard. It didn't require much brains to tell that they missed my chrysanthemum and couldn't see how I'd got through life without it. They called their fellows, the whole gang debated the subject while I lay like a sacrificial virgin. Then they decided that they'd struck a new line of research and went hot along the trail.

Seizing Blaine and the boob who'd played duck-on-the-rock, they untied them, stripped them down to the raw, examined them as if they were prize cattle at an agricultural exhibition. One of them prodded Blaine in the solar plexus, whereat he jumped the fellow with a savage whoop and brought him down. The other nudist joined in. Armstrong, who never had been a ninety-pound weakling, promptly burst his bonds, came up dark-faced with the effort and roared into the fray. Fragments of his mangled hammock swung and bounced on his beefy back.

All along the line the rest of us made mighty efforts to break free, but in vain. Green ones centered on the scene of the struggle, brittle spheres plopped all around the three madly fighting Earthmen. The tail mechanic and Blaine collapsed together, going down as if in a sleep. Armstrong shuddered and roared, teetered and pulled himself to, held out long enough to toss two natives into the river and slug the daylights out of a third. Then he, too, dropped.

V.

The green ones dragged their fellows from the river, dressed the slumber-wrapped Blaine and the other, added Armstrong, tied all three securely. Once more they conferred together. I couldn't make head or tail of their canary talk, but I got the notion that, in their opinion, we had an uncertain quantity of *gamish*.

My bonds began to irk. I'd have given much for the chance to go into action and bash a few green heads. Twisting myself, I used a lackluster eye to survey a tiny shrub growing near the side of the hammock. The shrub jiggled its midget branches and emitted a smell of burned caramel. Local vegetation was all movement and stinks.

Abruptly, the green ones ended their talk, crowded down to the bank of the river. A flotilla of long, narrow, shapely vessels swept around the bend, foamed under projecting branches of great trees, cut in to the bank. We were carted aboard, five prisoners to the boat. Thrusting away from the bank, our crew of twenty pulled and pushed rhythmically at a row of ten wooden levers on each side of the boat, drove the vessel upstream. We went along at a fair pace, left a shallow wake on the surface of the sluggish river.

"I had a grandfather who was a missionary," I told Jepson. "He got himself in trouble like this."

"So what?"

"He went to pot," I said.

"So can you," snapped Jepson. He strained futilely at his bonds.

For lack of anything better to do, I watched the way in which our crew handled our vessel, came to the conclusion that the levers worked two large pumps or a battery of small ones, and that the vessel got along by sucking in water at the bow and blowing it out at the stern. Later, I found I was wrong. Their method was much simpler than that. The levers connected with twenty split-bladed paddles jutting horizontally a foot or two below the water line. The two flaps of the blades closed together as each paddle drove forward, opened as it swept backward. By this means they got along a good deal faster than they could have done with oars since the subsurface paddles only moved forward and back with their weight on the boat—they didn't have to be raised turned and dipped by the muscles of the rowers.

The sun climbed higher as we progressed steadily upriver. On the second bend, the river split, its current moving more rapidly either side of a rocky islet about a hundred yards long. A group of four huge trees stood at the upstream end of the islet, their trunks and limbs a somber green that verged on black. Each of them had one horizontal spray of branches above which the trunk continued to a feathery crest forty feet higher. Every branch ended in half a dozen powerful twigs which curved downward like the fingers of a clutching hand.

Their crews speeding up the levers, the string of boats took the right-hand channel over which reached the largest of those great branches. As the first boat's prow came underneath, the branch twitched its fingers hungrily. It was no illusion; I saw it as clearly as I can see my trip bonus when they slide it toward me across the mahogany. That limb was getting all set to grab, and from its size and spread I reckoned it could pluck the entire boatload out of the water and do things of which I didn't care to think.

But it didn't do it. Just as that boat entered the danger area its helmsman stood up, bawled a string of gibberish at the tree. The fingers relaxed. The helmsman of the next boat did the same. And the next. Then mine. Flat on my back, as ready for action as a corpse, I gaped at that enormous neck-wringer while all too slowly it came on, passed above and fell behind. Our helmsman went silent; the one in the following boat took up the tale. There was dampness on my spine.

Five miles farther on, we made for the shore. My head was toward that side I didn't get a view of the buildings until the greenies contemptuously tossed out my hammock, released me from the thing, stood me on my feet. I promptly lost balance and sat down. Temporarily, my dogs were dead. Rubbing them to restore the circulation, my curious eyes examined this dump that might have been anything from a one-horse hamlet to a veritable metropolis.

The buildings were made of light green wood, all cylindrical, of uniform height and diameter, and each had a big tree growing through its middle. The foliage of each tree extended farther then the radius of each house, thus effectively hiding it from overhead view. Nothing could have been better calculated to conceal the place from the air, though there wasn't any reason to suppose that the inhabitants feared any menace from above.

Still, the way in which trees and buildings shared the same sites made it quite impossible to estimate the size of the place, for beyond the nearer screen of buildings were trees, trees and more trees, each of which may have shielded a house. I couldn't tell whether I was looking at a kraal or at the riverside suburb of some place running right over the horizon. It was little wonder that the exploring lifeboat had observed nothing but forest. Its crew could have scouted over an area holding a population of many millions and have thought it nothing but jungle.

Their weapons ready, their eyes alert, a horde of the green ones clustered around us while some of them finished the task of releasing the prisoners. The fact that we'd arrived in a thing like the *Marathon* didn't awe them one little bit. My feet were obedient now, so I lugged on my jackboots, stood up and looked around. It was then that I got two shocks.

The first hit me as I scanned my companions in misery. They consisted of little more than half the complement of the *Marathon*. The rest weren't there. One hammock held a still, lax figure that I recognized as the body of the guy who'd caught the darts soon after we landed. Upon another reposed the awake but dreamy, disinterested form of Sug Farn. But he was the only Martian present. None of the others were there. Neither were Chief Douglas, Bannister, Kane, Richards, Kelly, Jay Score, Steve Gregory, young Wilson and a dozen others.

Were they dead? It didn't seem so—else why should the greenies have transported one body and not the others? Had they escaped, or did they form a second party of prisoners that had been taken elsewhere? There was no way of determining their fate, yet it was strange that they should be missing.

I nudged Jepson. "Hey, have you noticed—"

Came a sudden roar over that river and all the green ones stared upward and gesticulated with their weapons. They made mouth motions, but the roar drowned them out. Whirling around, I could feel my eyes bugging as the *Marathon's* sleek pinnace dived within a few feet of the surface of the river, soared upward again. It vanished over the treetops, drummed into the distance.

Then I could hear it sweeping round in a wide circle. Its note accelerated as it went into another dive, it shot back into view, swooped so low that it touched the surface of the water, whisked a shower of green droplets behind it and sent a small wash lapping into the bank. Then it was gone in another swift and uproarious soar, bulleting past at such a rate that it was impossible to see the pilot's cabin.

Jepson spat on his fist, gave the greenies a sour eye, and said, "They've got it coming to them, the lice!"

"Tut!" I chided.

"As for you," he went on. He didn't get a chance to say more because a tall, thin, mean-looking greenie suddenly picked on him.

This one gave him a contemptuous shove in the chest and piped something on a rising note of interrogation.

"Don't you do that to me!" snarled Jepson, giving an answering shove.

The green one staggered backward, recovered his balance, kicked out with his right leg. I thought he was trying to give Jepson a crack on the shins, but he wasn't. He was throwing something with his foot and what he threw was alive. All I could see of it was something that may or may not have been a tiny snake. It had no more length and thickness than a pencil and, for a change, it wasn't green but a bright orange color relieved by small, black spots. It landed on Jepson's chest, bit him, then flicked down his front so fast that I could hardly follow it. Reaching the ground, it made the grass fairly whip aside as it streaked back to its owner.

Curling around the green one's ankle, it went supine, looking exactly like a harmless leg ornament. A very small number of the other natives were wearing similar objects all of which were orange and black excepting one which was yellow and black.

Jepson bugged his eyes, opened his mouth, but emitted no sound. He teetered. The guy wearing the yellow and black lump of wickedness was standing right at my side watching Jepson with academic interest. I broke his neck. The way it snapped reminded me of a rotten broomstick. That thing on his leg left him the moment he was mutton, but fast as it moved it was too late. Jepson fell onto his face just as my jackboot scrunched the thing into the turf.

There was a hullabaloo all around me. I could hear McNulty's anxious voice yelping, "Men! Men!" Even at a time like this the crackpot could dwell on the vision of himself being demoted for tolerating maltreatment of natives. Armstrong kept bawling, "Another bugger!" and each time there followed a loud splash in the river. Things were going *phut-phut* and spheres were crashing again. Jepson lay like one dead while combatants stumbled over his body. Brennand barged up against me. He was breathing in quick puffs and trying to gouge a black eye out of a green face.

By this time I'd got myself another aborigine and proceeded to take him apart. I tried to imagine that he was a fried chicken of which I never seem to get any more than the piece that goes last over the fence. He was hard to hold, this greenie, and bounced around like a rubber ball. Over his swaying shoulder I could see Sug Farn juggling with five at once and envied him the anacondas he used for limbs. My opponent stabbed his fingers into the chrysanthemum I didn't possess, looked surprised at his own forgetfulness, was still trying to think of something else as he went into the river.

Then half a dozen spheres cracked open at my feet and the last I remember hearing was Armstrong bellowing just before a splash. The last I remember seeing was Sug Farn suddenly shooting out a spare tentacle he'd temporarily overlooked and using it to arrange that of the six greenies who jumped me only five landed. The other one was still going up as I went down.

For some reason I didn't pass out as I'd done before. Maybe I only got a half-dose of whatever the spheres gave forth, or perhaps they contained a different mixture. All I know is that I went down with five aborigines aboard my ribs, the skies spun crazily, my brains turned to porridge. Then, astonishingly, I was awake, my upper limbs again tightly bound.

Over to the left a group of natives made a heaving pile atop some forms that I couldn't see but could easily hear. Armstrong was doing some championship hog-calling underneath that bunch which, after a couple of hectic minutes, broke apart to reveal his tied body along with those of Blaine and Sug Farn. On my right lay Jepson, his limbs quite free, but the lower ones apparently helpless. There was now no sign of the pinnace.

Without further ado the greenies whisked us across the sward and five miles deep into the forest, or city, or whatever it ought to be called. Two of them bore Jepson in a sort of wicker hamper. There were still as many trees as houses. Here and there a few impassive citizens came to the doors of their abodes and watched us dragging on our way. You'd have thought we were the sole surviving specimens of the dodo.

Minshull and McNulty were right behind me in this death parade, and I heard the latter say, pontifically, "I shall speak to their leader about this. I shall point out to him that all these unfortunate struggles are the inevitable result of his own people's bellicosity."

"Undoubtedly," afforded Minshull, with a touch of sardonic heartiness.

"Making all allowances for mutual difficulties of understanding," McNulty went on, "I still think that we are entitled to be received with a modicum of courtesy."

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"Quite," said Minshull. His voice was now solemn, like that of the president of a mortician's convention. "And we consider that our reception left much to be desired."

"Precisely my point," said the skipper.

"And any further hostilities would be most deplorable," continued Minshull.

"Of course!" McNulty enthused.

"In which event we'll tear the guts out of every greenie on this stinking planet."

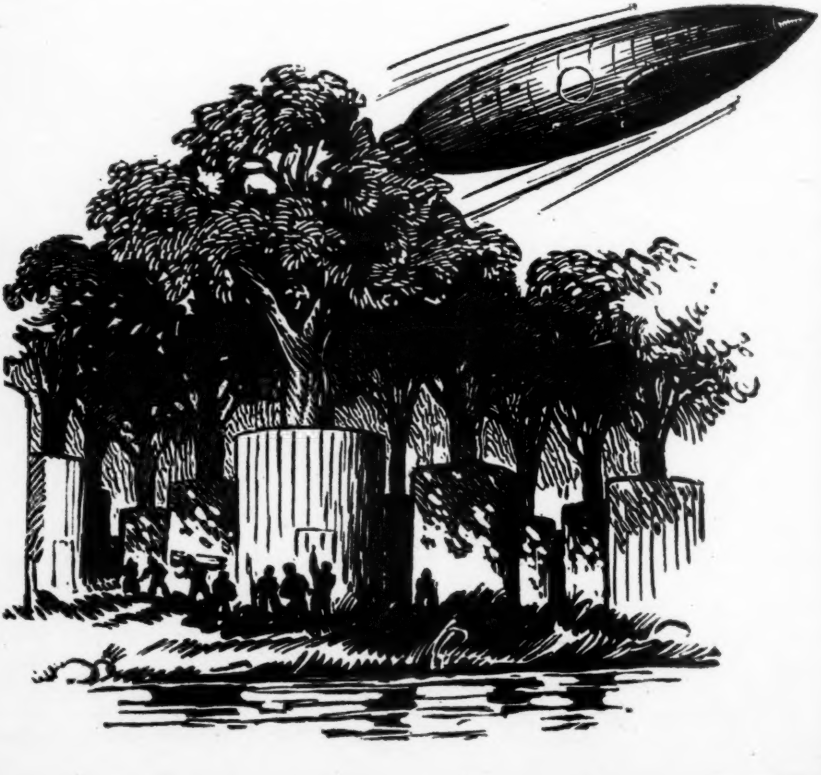
"Eh?" McNulty paused in his pace. His voice went up in pitch.

"Nothing," lied Minshull, amiably. "I didn't even open my mouth."

What the outraged shipmaster intended to say remained a mystery, for at this point a greenie caught him lagging and prodded him on. With an angry snort, he speeded up, moving in introspective silence from then on.

Presently, we emerged from a long, orderly line of tree-shrouded homes and entered a glade fully twice as large as that in which the missing *Marathon* had made its landing. It was roughly circular, its surface level and carpeted with close-growing moss of a rich, emerald green. The sun, now well up in the sky, poured a flood of pale-green beams into this strange amphitheater around the fringes of which clustered a horde of silent, expectant natives.

The middle of the glade captured our attention. Here, as outstanding as the biggest skyscraper in the old home town, soared a veritable monster among trees. How high it went was quite impossible to estimate, but it was large enough to make Terra's giant redwoods look puny by comparison. Its bole was a full forty feet in diameter, and the spread of its



oaklike branches looked immense even though they were way, way up there. So enormous was this mighty growth that we just couldn't keep our eyes off it. If these transcosmic Zulus were going to hang us, well, they sure intended to do it high and handsome. Our kicking bodies wouldn't look more than a few struggling bugs dangling between Earth and heaven.

Minshull must have been afflicted by the same thought, for I heard him say to McNulty, "There's the Christmas tree! We're the ornaments. They'll draw lots for us, and the boob who gets the ace of spades will be the fairy at the top."

"Don't be morbid," snapped McNulty. "They'll do nothing so illegal."

Then a native pointed at the positive skipper and six pounced on him before he could dilate further on the subject of intercosmic law. With complete disregard for all the customs which the victim held holy, they bore him toward the waiting tree.

VI.

Up to that moment we'd failed to notice the drumming sound which thundered dully from all around the glade. It was strong now, and held a sinister quality in its muffled, insistent beat. The weird, elusive sound had been with us from the start; we'd got used to it, had become unconscious of it in the same way that one becomes insensitive to the ticking of a familiar clock. But now, perhaps because it lent emphasis to the dramatic scene, we were keenly aware of that deadly *throb, throb, throb.*

The green light made the skipper's face ghastly as he went forward. All the same, he still managed to lend importance to his characteristic strut, and his features had the air of one who has unshakable faith in the virtue of sweet reasonableness. I've never encountered a man with more confidence in the law. As he walked forward, I know he was supported by the profound conviction that these poor people could do nothing drastic with him unless they first filled in the necessary forms and got them properly stamped and signed. Whenever McNulty died, it was going to be with official approval.

Halfway to the tree the skipper and his guard were met by nine tall natives. The latter were dressed in no way different from their fellows, yet, in some vague manner, managed to convey the impression that they were beings apart from the common herd. Witch doctors, decided my agitated mind.

Those holding McNulty promptly handed him over to the newcomers, then beat it toward the fringe of the glade as if the devil himself had appeared in the middle. There wasn't any devil; there was only that monstrous tree. Still, knowing what some growths could and did do in this green-wrapped world it was highly probable that this, the grandpappy of all trees, was capable of some unique wickedness. Of that lump of statuesque timber one thing was certain—it possessed a damned good dollop of *gamish.*

Briskly, the nine stripped McNulty to the waist. He was talking to them all the time, but he was too far away for us to get the gist of his lecture, and his captors took not the slightest notice. Again they examined his chest, conferred among themselves, abruptly started dragging him nearer to the tree. McNulty resisted with appropriate dignity. Picking him up bodily, they carried him forward.

Armstrong said, in harsh tones, "We've still got legs, haven't we?" and forthwith kicked his nearest guardian's feet from beneath him.

But before any of us could follow his example and start another useless melee an interruption came from the sky. Upon the steady drumming from the forest was superimposed another fiercer, more rapid roll which quickly merged its beasts to a rising howl. The howl waxed to an explosive roar as, swift and silvery, the pinnace swooped low over the fateful tree.

Something dropped from the belly of the bulleting boat, something which blew out to mushroomlike shape, hesitated in its fall, then lowered gently into the head of the tree. It was a parachute! I could see a figure hanging in its harness just before he was swallowed in the deeps of that elevated foliage. The distance made it quite impossible to recognize this invader from above.

The nine who were bearing McNulty dropped him unceremoniously on the sward, gazed expectantly at the tree. Strangely enough, aërial manifestations filled these natives more with curiosity than fear. The tree stood unmoving. Suddenly, amid its top branches, the thin beam of a needle ray lanced forth, touched a large branch at its junction with the trunk, and severed it. The amputated limb went whirling to the ground.

At once a thousand budlike protuberance which lay concealed between the leaves of the tree swelled up as if they were blown balloons, reached the size of giant pumpkins, and burst with a fusillade of dull pops. They gave out a light yellow mist, exuding the stuff at such a rate that the entire tree was clouded with it in less than one minute. All the natives within sight hooted like a gang of owls, turned and ran. McNulty's nine guardians also called off the ceremony they'd had in mind and started after their fellows. The needle caught two of them before they'd gone ten steps: the remaining seven doubled their pace. McNulty was left struggling with the bonds around his wrists while slowly the mist crawled toward him.

Again the beam speared high up in the tree which had grown dim within the envelope of its own fog, and again a branch went to ground. The last native had faded from sight. The creeping mist was now within thirty yards of the skipper who was standing and watching it like a man fascinated. His wrists were still tied to his sides. Deep insde the mist the popping sounds continued, though not as rapidly.

Yelling at the witless McNulty to make use of his nether limbs, we struggled furiously with our own and each other's bonds. McNulty responded no more than to shuffle backward a few yards. By a superhuman effort Armstrong burst free, snatched a jackknife from his pants pocket, started cutting our arms loose. Minshull and Blaine, the first two thus relieved, immediately raced to McNulty who was posing within ten yards of the mist like a portly Ajax defying the power of alien gods. They dragged him back.

Just as we'd all got rid of our bonds the pinnace came round in another wide sweep, vanished behind the column of yellow cloud and thundered away into the distance. We gave it a hoarse cheer. Then from the mist strode a great figure dragging a limp body with each hand. It was Jay Score. He had a tiny two-way radio on his back.

He came toward us, big, powerful, his eyes aflame with their everlasting fires, released his grip on the pair of cadavers, said, "Look—this is what that vapor will do to you unless you move out plenty fast!"

We looked. These things were the remains of the two natives he'd needled, but the needlers had not caused that awful rotting of the flesh. Both leprous objects were too far gone to be corpses, not far enough to be skeletons. They were mere rags of flesh and half-eaten organs on frames of festering bone. It was easy to see what would have happened to Jay had he been composed of flesh and blood, or had he been a breather.

"Back to the river," advised Jay, "even if we have to fight our way through. The *Marathon's* going to land on the front. We must reach her at all costs."

"And remember, men," put in McNulty, "I want no unnecessary slaughter."

That was a hell of a laugh. Our sole weapons now consisted of Jay's needler, Armstrong's jackknife, and our fists. Behind us, already very near and creeping steadily nearer, was the mist of death. Between us and the river lay the greenie metropolis with its unknown number of inhabitants armed with unknown devices. Veritably we were between a yellow devil and a green sea.

We started off, Jay in the lead, McNulty and the burly Armstrong following. Behind them, two men carried Jepson who could use his tongue even if not his legs. Two more bore the body which our attackers had borne all the way from the ship. Without opposition or mishap we got a couple of hundred yards deep into the trees and there we buried the corpse of the man who was first to set foot on this soil. He went from sight with the limp silence of the dead while all around us the forest throbbed.

In the next hundred yards we were compelled to bury another. The surviving duck-on-the-rock player, sobered by the end of his buddy, took the lead as a form of penance. We were marching slowly and cautiously, our eyes alert for hidden natives, our wits ready for any untoward move by a dart-throwing bush or a goo-smearing branch.

The man in front swerved away from one tree which topped an empty and silent greenie abode. His full attention was upon the vacant entrance to that house, and he failed to be wary of another tree under which he had moved. This growth was of medium size, had a silvery green bark, long, ornamental leaves from which dangled sprays of stringy threads. The ends of the threads came within four feet of the ground. He brushed against two of them. Came a sharp, bluish flash of light, a smell of ozone and scorched hair, and he dropped. He'd been electrocuted as thoroughly as if smitten by a stroke of lightning.

Mist or no mist, we carried him back the hundred yards we'd just traversed, buried him beside his comrade. That job was done in the nick of time. The crawling leprosy was at our very heels as we resumed our way. High in the almost concealed sky the sun poured down its limpid rays and made mosaic patterns through overhead leaves.

Giving a wide berth to this latest menace, which we named the voltree, we hit the end of Main Street. Here, we had the advantage in one way, though not in another. The houses stood dead in line and well apart; we could march along the center of the route beneath the wider gap of sky and be beyond reach of this planet's bellicose vegetation. But this made our march exposed to attack from any direction by any natives who might be determined to oppose our escape. We'd have to do the trip, one way or the other, with our necks stuck out a yard.

Sug Farn said to me, "You know, I've an idea well worth developing."

"What is it?" I demanded, hopefully.

"Supposing that we had twelve squares aside," he suggested, "we could then have four more pawns and four new master pieces. I propose to call the latter 'archers.' They would move two squares forward, and could take opponents one square sidewise. Wouldn't that make a beautifully complicated game?"

"You," I told him, "may go drown yourself!"

"As I should have known, your mental appreciation is poor." So saying, he extracted a bottle of *hooloo* scent which somehow he'd managed to retain through all the turmoil, moved away from me, and sniffed it in a deliberately offensive manner. I don't give a damn what anybody says—we don't smell like Martians say we do! These octopuses are downright liars.

Stopping both our progress and argument, Jay Score growled, "I guess this'll do." Unhitching his portable radio, he tuned it up, said into its microphone. "That you, Steve?" A pause, then, "Yes, we're waiting about a quarter of a mile on the river side of the glade. No, there's been no opposition—yet. But it'll come, it'll come. O. K., we'll wait." Another pause. "We'll give it guidance by sound."

Turning his attention from the radio to the sky, but with one earpiece still in action, he listened intently. We all listened. For a while there was nothing but that *throb, throb, throb* which never ceased upon this crazy world, but presently came a faraway drone like the hum of an approaching bumblebee.

Jay snatched at the mike. "We've got you. You're coming nearer." The drone grew louder. "Nearer, nearer." He waited a moment. "Now you're away to one side." The drone drifted off. "No, you've swerved the wrong way." Another brief wait. The distant sound suddenly grew strong. "Heading correctly now." The drone swelled to a roar. "Right!" yelled Jay. "You're almost on us!"

He looked expectantly upward, and we followed his gaze like one man. The next instant the pinnace raced across the sky gap at such a pace that it had come and gone in less time than it takes to draw one breath. But those aboard must have seen us for the little vessel zoomed around in a wide, graceful arc, hit the main stem a couple of miles farther down, and came up it at terrific speed. This time, we could watch it most of the way, and we yelled at it as if we were a gang of excited kids.

"Got us?" inquired Jay of the microphone. "All right, try it on the next run."

Again the pinnace swept around, struck its former path, tore the air as it traveled toward us. It was like a monster shell from some old-time cannon. Things fell from its underside as it neared us, bundles and packages in a parachuted stream. The stuff came down as manna from heaven while the sower passed uproariously on and dug a hole in the northern sky. But for these infernal trees the pinnace could have landed and snatched the lot of us from danger's grasp.

Eagerly we pounced on the supplies, tearing covers open and dragging out the contents. Spacesuits for all. Well, they'd preserve us from various forms of gaseous unpleasantness. Needlers, oiled and loaded, together with reserves of excitants. A small case, all sponge rubber and cotton wool, containing half a dozen atomic bombs. An ampoule of iodine and a first-aid pack apiece.

One large bundle had become lodged high up in the branches of a tree, or rather its parachute had become entangled and it was dangling enticingly from the ropes. Praying that it contained nothing liable to blast the earth from beneath us, we needled the ropes and brought it down. It proved to hold a good supply of concentrated rations and a three-gallon can of pineapple juice.

Packing the chutes and shouldering the supplies, we started off. The first mile was easy: just trees, trees, trees and abandoned houses. It was on this part of the journey that I noticed that it was always the same type of tree which surmounted a house. There was no abode built around any of those goo-trees or voltress of whose powers we now knew too well. Whether those particular trees were innocuous was something nobody seemed inclined to discover, but it was here that Minshull discovered in them the source of that everlasting throbbing.

Disregarding McNulty, who was clucking at him like an agitated hen, he tiptoed into one empty house, his needler held forward in readiness for trouble. A minute later he came out, said that the building was deserted, but that the tree in its center was booming like a tribal tom-tom. He'd put his ear to its trunk and had heard the beating of its mighty heart.

That started a dissertation by McNulty, his subject being our legal right to mutilate or otherwise harm the trees of this planet. If, in fact, they were semisentient, then in law they had the

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status of aborigines and as such were subject to subsection so-and-so, paragraph such 'n' such of the Intercosmic Code governing planetary relations. He got down to this with gusto and with typical disregard for the fact that he might be boiled in oil by nightfall.

When he paused for breath, Jay Score said, evenly, "Skipper, maybe these people have laws of their own and are about to enforce them!" He pointed straight ahead.

I followed his unemotional finger, then frantically poured myself into my spacesuit. This, I thought, is it! The long arm of justice was about to face me with that poor guppy.

VII.

What awaited us about half a mile ahead was a vanguard of enormous, snakelike things fully as thick as my body and about a hundred feet in length. They were writhing in our general direction, their movements peculiarly stiff and lacking in sinuosity. Behind them, also moving awkwardly forward, was a small army of bushes deceivingly harmless in appearance. And behind those, hooting with the courage of those who now feel themselves secure, was a great horde of natives. The progress of this nightmarish crowd was determined by the pace of the snakish objects in front, and these crept forward in tortuous manner as if they were trying to move a hundred times faster than nature had intended them to move.

Aghast at this crazy spectacle, we stopped. The creepers came steadily on and somehow managed to convey an impression of tremendous strength awaiting sudden release. The nearer they got, the bigger they looked, and when they were a mere three hundred yards away I knew that any one of them could embrace a bunch of six of us and do more to us than any boa constrictor ever did to a hapless goat.

These were the wild ones of a vast and semisentient forest. I knew it instinctively, and I could hear them faintly mewing as they came on. These, then, were my bright green tigers, samples of the thing our captors had slaughtered in the emerald jungle. But they could be tamed, their strength and fury kept on tap. This tribe had done it. Veritably, they were higher than the Ka.

"I think I can just about make this distance," said Jay Score when the intervening space had shrunk to two hundred yards.

Nonchalantly, he thumbed an atomic bomb which could have made an awful mess of the *Marathon*. His chief weakness was that he never could appreciate the power of things that go bang. So he juggled it around in a way that made me wish him some place the other end of the cosmos, and just when I was about to burst into tears, he threw it. His powerful right arm whistled in the air as he flung the missile in a great arc.

We flattened. The earth heaved like the belly of a sick man. Huge clods of plasma and lumps of green, fibrous stuff geysered, hung momentarily in midair, then showered all around us. We got up, raced forward a hundred yards, went prone as Jay tossed another. This one made me think of volcanoes. Its blast nearly pushed me back into my boots. The uproar had scarcely ceased when the pinnace reappeared, dived upon the rear ranks of the foe, and let them have a couple there. More disruption. It tied me in knots to see what went up.

"Now!" yelled Jay. Grabbing the handicapped Jepson, he tossed him upon one shoulder and pounced forward. We drove with him as one man.

Our first obstacle was a great crater bottomed with tired and steaming earth and some mutilated, yellow worms. Cutting around the edges of this, I leaped a six-feet length of blasted creeper which, even in death, continued to jerk spasmodically and horribly. There were many more odd lengths writhing between here and the next crater. All

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were greener than any complexion, and bristled with hairlike tendrils which squirmed around as if seeking the life that had gone. The one hundred yards between craters we covered in record time, Jay still in the lead despite his heavy burden. I was sweating like a tormented bull, and I thanked my lucky star for the low gravity which enabled us to keep up this frantic pace.

Again we split and raced around the rim of the second crater. This brought us nose to nose with the enemy, and after that, all was confusion.

A bush got me. Sheer Terrestrialism made me disregard the darned thing despite all my recent experiences. I had my eyes off it, and in an instant it had shifted to one side, wrapped itself around my legs and brought me down. I went prostrate, unharmed but cursing, and the bush methodically sprinkled my space fabric with a fine gray powder. Then a long, leatherish tentacle snaked from behind me, ripped the bush from my form, tore it to pieces.

"Thanks, Sug Farn!" I breathed, got up, and charged on.

A second bellicose growth collapsed before my needler and the potent ray carried on another sixty or seventy yards and roasted the guts of a yelling, gesticulating native. Sug snatched a third bush, scattered it with scorn. The powder it emitted did not seem to affect him.

Jay was now twenty yards ahead. He paused, flung a bomb, dropped, got up and raced on, Jepson still grasped in his mighty left arm. The pinnace howled overhead, dived, created wholesale slaughter in the enemy's rear. A needle ray spurted from behind me, lanced dangerously close to my helmet, and burned a bush. I could hear in my phone a constant and monotonous cursing as I pounded along. On my right, a great tree lashed furiously and toppled headlong, but I had neither time nor inclination to look at it.

Then a snake got Blaine. How it had survived, alone among its blasted fellows, was a mystery. It lay jerking exactly like all the other tattered bits and pieces, but it was still in one, long lump and, as Blaine jumped it, the thing curled viciously, wound around him. He shrieked into his mouthpiece, and the sound of his dying was terrible to hear. His spacesuit sank in and his blood spurted out between the folds. The sound and the sight shocked me so much that I stopped abruptly, and Armstrong blundered into me from behind.

"Get going!" he roared. With his needler he sliced the green constrictor, segmenting it with savage gusto. We charged on, perforce leaving behind Blaine's crushed and broken corpse.

Now we were through the fronting ranks and into the natives whose numbers miraculously had thinned. Brittle globes plopped all around our thudding feet, but their gaseous contents were as harmless as summer air. We were protected and, in any case, we were moving too fast to get a whiff. I needled three greenies in rapid succession, saw Jay tear off the head of another without as much as pausing in his heavy onrush.

We were gasping with exertion when unexpectedly the foe gave up. The remaining natives melted into their protecting forest just as the pinnace roared vengefully toward them again. Our way was clear. Not slackening our pace in the slightest, and with eyes alert and weapons ready, we raced to the water front, and there, lying in the great space of bright green sward, found the sweetest sight in the entire cosmos—the *Marathon!*

It was here that Sug Farn put a scare into us, for as we sprinted joyfully toward the open port, he beat us to it, held up the stump of a tentacle, said, "It would be as well if we do not enter—yet."

"Why not?" demanded Jay. His cold, glowing eyes settled on the Martian's stump. "What the devil happened to you?"

"I was forced to shed a limb," said Sug Farn, mentioning it with the air of one to whom shedding a limb is like taking off a hat. "It was that powder. It was made of a million insects. It crawls around and it eats. It was eating me. Look at yourselves!"

By hokey, he was right! Now that I came to look at it, I could see small clusters of gray powder changing shape on my spacesuit. It was moving around. Sooner or later, it would eat its way through—and then start on me. I've never felt lousier in my life. So, keeping watch upon the fringe of the forest, we had to spend an impatient and sweaty half-hour roasting each other's suits with needlers turned to wide jet and low power. I was cooked by the time the last microscopic louse dropped off.

Young Wilson seized the opportunity to dig out a movie camera and record our communal decontamination. This, I knew, eventually would be shown to an amused world sitting in armchair comfort far, far from the troubles surrounding Rigel. Secretly, I wished that a few surviving bugs would somehow manage to get around with the film. With a more official air, he also got shots of the forest, the river, and a couple of upturned boats with all their bivalve paddles exposed. Then, thankfully, we all piled into the spaceship.

The pinnace was lugged aboard and the *Marathon* blew off pronto. I don't think there's ever been a time when I felt more like a million dollars than I did when normal, glorious light came through the ports and the bilious green coloring faded from our faces. With Brennand, I watched this strange, eerie world sink below us, and I can't say I was sorry to see it drop.

Jay came along said, "Sergeant, we're not making any further landings. The skipper's decided to return to Terra at once and make a full report."

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"Why?" asked Brennand. He gestured below. "We've come away with practically nothing worth having!"

"McNulty thinks we've learned quite enough." The rhythmic thum of the stern tubes sounded through his momentary silence. "He says he's conducting an exploratory expedition and not managing a slaughterhouse. He's had enough and is thinking of offering his resignation."

"The dunderhead!" said Brennand, with total lack of reverence.

"What have we learned, if anything?" I asked.

"Well, we know that life on that planet is mostly symbiotic," Jay replied. "There, different forms of life share their existence and their faculties. Men share with trees, each according to his kind. The communal point is that queer chest organ."

"Drugs for blood," said Brennand. "Bah!"

"But," Jay went on, "there were some higher than the Ka and their kind, some so high and godlike that they could depart from their trees and travel the globe, by day or by night. They could milk their trees, transport their nourishment and absorb it from bowls. Of the partnership imposed upon them, they had gained the mastery, and, in the estimation of this planet, they alone were free!"

"How fallen are the mighty," I commented.

"Not so," Jay contradicted. "We have killed, but not conquered. The world is still theirs. We are retiring, with our losses—and we still have Jepson to cure!" He turned away.

A thought struck me, and I said to him, "Hey, what happened during that assault on the ship? And how did you keep track of us?"

"It was a losing fight, so we blew free," he replied. "After that, we followed you very easily." His eyes were always inscrutably aflame, but I will swear that there was a touch of humor in them as he went on. "You had Sug

Farn with you. We had Kli Yang and the rest." He tapped his head suggestively. "The Martians have much *gomish*."

"Hell, telepathy!" yelped Brennand. "I forgot all about that. Sug Farn never said a word. That cross-eyed spider just slept every chance he got!"

"Nevertheless," said Jay, "he was constantly in touch with his fellows!"

He went along the passage, rounded the corner. Then the warning alarm sounded, and Brennand and I clung like brothers while the ship switched to Flettner drive. The green world faded to a dot with swiftness that never failed to astound me. We took fresh hold on ourselves, rubbed our distorted innards into shape. Then Brennand went to the valve of the storrad air lock, turned the control, watched the pressure gauge crawl from three pounds to fifteen.

"The Martians are inside there," I pointed out. "And they won't like that.

"I don't want 'em to like it. I'll teach those rubber caricatures to hold out on me!"

"McNulty won't like it either."

"Who cares what McNulty likes!" he yelled. Then McNulty himself came around the corner, walking with portly dignity, and Brennard promptly added, in a still louder voice, "You ought to be a darned sight more respectful and refer to him as the skipper."

When you travel the void, never mind the ship—pick the guys who're going to accompany you in it!

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In Times To Come

The major item of news for next month is, of course, the item discussed on the Editor's Page—the change in size and make-up of the magazine. The inclusion of sixteen pages of rotogravure, with the attendant possibilities of getting good photographic reproduction will, in future issues, make possible a number of articles I haven't been able to handle.

But this department is primarily intended as a forecast of stories next month. The lead yarn is another of George O. Smith's Venus Equilateral stories. George Smith is—as you might conceivably have guessed from the tone of familiarity with which his characters handle radio and electronic work—a radio engineer, research division in particular. Most of the gadgetry of Venus Equilateral exists as a fairly coherent reality in his mind. I imagine—the type of tubes, physical size of coils needed, et cetera. And some of the sour experiments he's personally encountered, I suspect led him to the basic idea of "Recoil," the novelette coming up in November. Why you can't blow holes in spaceships with electron guns, or the phenomenon of the Free Grid. Point is, if you remember, the ships of the Venus Equilateral stories normally operate under a constant-acceleration drive, maintaining approximately a 1-G drive. No ordinary, or even extraordinary, explosive-propelled gun is going to be effective against such a target. So—how do you get rid of pirates in the hair?

Why, surely, a ray gun! Burn him out of space with an electron gun!

Oh, yes? 'Twon't work. You can't even get his ship comfortably warm, even if you use the whole enormous high-voltage power system of Venus Equilateral; there's a good—and inescapable—simple reason why it's impossible. Anyone equipped with first-year physics or better should be able to spot it.

THE EDITOR.

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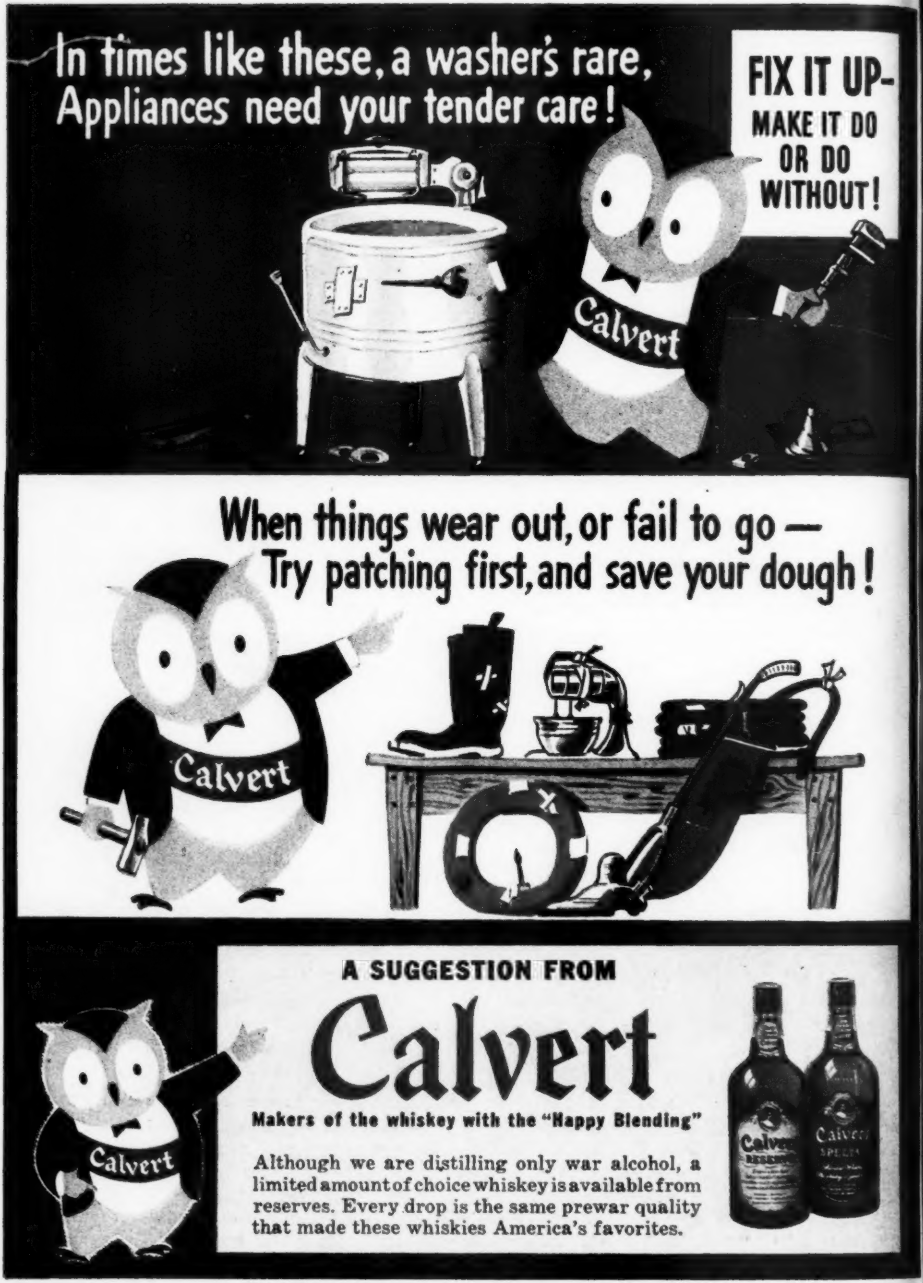
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